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ABSTRACT

This document presents the Texas master plan for educational technology developed by the Education Technology Coordinating Council (ETCC). An executive summary lists ETCC goals and recommendations. The first section of this report provides an overview of educational technology in Texas, including: background; the charge, implementation, guiding principles, and mission of the ETCC; expected benefits of and guidelines for successful collaborative efforts; and challenges in collaboration. The second section presents description, definitions, level of impact, lead agency, participating agencies, objectives, limitations, and date of implementation for each of the eight ETCC goals. The third section summarizes implementation strategies for achieving statewide collaboration on educational technology, consisting of 12 recommendations. The fourth section describes initiatives of several agencies involved with planning and implementing educational technology in Texas. The fifth section is a glossary of terms. The sixth section is an annotated bibliography of 31 titles to assist in understanding and applying research-based findings and identifying best practices in the applications of technology to improve learning. Appendices include: the Texas Education Agency (TEA) Rider 74 (i.e., the ETCC charge); proposed revisions to TEA Rider 74; the ETCC mission and charter statement; the ETCC membership roster; and State Board for Educator Certification (SBEC) technology application standards. (MES)

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State of Texas Master Plan for Educational Technology 2000 - 2003

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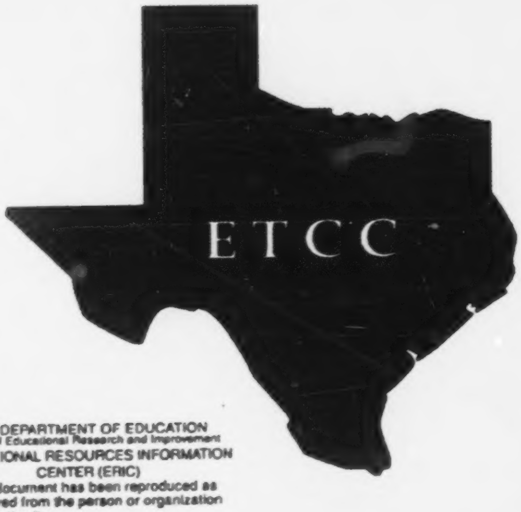

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Developed by the Education Technology Coordinating Council

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Jim Nelson
Commissioner of Education

January 2001

The Honorable Rick Perry, Governor of Texas
The Honorable Bill Ratliff, Lieutenant Governor of Texas
The Honorable Pete Laney, Speaker of the House of Representatives

We are pleased to share with you the *State of Texas Master Plan for Educational Technology 2000-2003*. This plan was developed by the Education Technology Coordinating Council (ETCC) as called for under the provisions of Rider 74, House Bill 1, 76th Legislature to the Texas Education Agency.

Respectfully,

Jim Nelson

Jim Nelson
Commissioner of Education

Carolyn Purcell

Carolyn Purcell, Executive Director
Department of Information Resources
Education Technology Coordinating Council, Chair

Education Technology Coordinating Council
Statement of Endorsement

The following state entities endorse the
State of Texas Master Plan for Educational Technology 2000-2003

Jim Nelson, Commissioner
Texas Education Agency
Date 1/17/01

Carolyn Purcell
Carolyn Purcell, Executive Director
Department of Information Resources
12/18/2000
Date

Jim Muse
Jim Muse, Executive Director
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Date

Pamela Tackett, Executive Director
State Board for Educator Certification
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Date

Robert J. "Sam" Tessen, Executive Director
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Date

Don W Brown
Don Brown, Commissioner
Higher Education Coordinating Board
12/15/00
Date

John Beck
Southwest Texas State University,
On behalf of the Colleges of Education
12/7/00
Date

Paul Resta
University of Texas,
On behalf of the Colleges of Education
12/6/00
Date

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Contents

Executive Summary 1

Educational Technology in Texas 7

ETCC Goals 13

Implementation Strategies 35

Investing in Texas 41

Glossary of Terms 53

Selected Bibliography 63

Appendix 71

- TEA Rider 74 74
- Proposed Revisions to TEA Rider 74 75
- Mission and Charter Statement 76
- Membership Roster 81
- Agency Website Addresses 85
- SBEC Technology Applications Standards 87

Supplemental Information:

CEO Forum's *Interactive Teacher Preparation STaR Chart*

Texas STaR Chart

Executive Summary

Executive Summary

The 76th Legislature's House Bill 1 established the Education Technology Coordinating Council (ETCC or the Council). The Council consists of representatives from the Texas Education Agency (TEA), the Department of Information Resources (DIR), the General Services Commission (GSC), the State Board for Educator Certification (SBEC), the Telecommunications Infrastructure Fund (TIF) Board, the Texas State Library and Archives Commission (TSLAC), the Texas Higher Education Coordinating Board (THECB), and the Colleges of Education. For the purposes of this report, Colleges of Education refers to schools, colleges, or departments of education (SCDE).

The Council is charged with ensuring "the cooperation and coordination of the state's efforts to implement educational technology initiatives," and to develop "a statewide master plan for education technology." The Legislature instructed the Council to pay "particular attention to the coordination of pre-service and in-service training for teachers and librarians."

GOALS

Eight goals were developed by the Council members.

Goal 1: Articulate the vision for and maintain a unified policy direction among Council members to guide the creation and implementation of educational technology initiatives in Texas.

Goal 2: Ensure quality pre-service and professional development to enable educators to effectively and efficiently use technology to improve student learning and administrative processes.

Goal 3: Develop the leadership in planning and implementation needed to ensure effective and efficient use of the technologies made available to educators.

Goal 4: Coordinate technology-related funding processes among state agencies to provide maximum benefits to schools and teacher preparation institutions, and issue grants to maximize a coordinated effort.

Goal 5: Help educational institutions understand the resources that are available and the most beneficial ways to use them.

Goal 6: Identify and develop profiles and select and disseminate exemplary practices of technology infrastructures within the state.

Goal 7: Promote a minimum level of technology access and use in the state's local education agencies and teacher preparation institutions.

Goal 8: Promote interoperability of technology resources and processes to derive maximum benefits for state and local investments in technology resources.

The success of the goals established by the ETCC is highly dependent on the collaboration of member agencies. The table below highlights the involvement of each member agency by goal.

ETCC Goals	TEA	DIR	GSC	SBEC	TIF	TSLAC	THECB	SCDE
Goal 1 (Vision)	▨ √	▨ √	▨ √	▨ √	▨ √	▨ √	▨ √	▨ √
Goal 2 (Professional Dev.)	▨ √			▨ √	√	√	√	▨ √
Goal 3 (Leadership)	√			√		√		▨ √
Goal 4 (Coordination)	▨ √	√	√		▨ √	√		√
Goal 5 (Resources)	▨ √				▨ √	√		√
Goal 6 (Profiles)	√	√	√	√	▨ √	√	√	√
Goal 7 (Access)	▨ √	√	√	√	√	√	√	√
Goal 8 (Interoperability)	√	▨ √	√		√	√		

NOTE: The lead agency or agencies are shaded. For agency names associated with acronyms shown in chart above, see page 3.

RECOMMENDATIONS

The ETCC's goals provide the basis for comprehensive planning of educational technology initiatives, and set the direction and tone for coordination and collaboration among state agencies and institutions of higher education in Texas. The recommendations in this report form a statewide plan for collaboratively implementing educational technology. In brief, the Council's recommendations are as follows:

1. Amend Rider 74, House Bill 1, 76th Legislature to continue the Education Technology Coordinating Council or successor group, and include Rider 74 in the bill pattern of each participating agency.
2. Continue coordination among the Telecommunications Infrastructure Fund Board, Texas Education Agency and Texas State Library grant processes.
3. Identify E-Rate funding recipients and assist non-participants in securing funding.
4. Develop a process for the SCDE to infuse technology within teacher education.
5. Develop a process for Colleges of Library Sciences to infuse technology within librarian education.
6. Identify models and strategies to provide opportunities for in-service educators to meet the technology proficiency benchmarks as established by SBEC.
7. Establish minimum standards for technology sustainability at schools and libraries.
8. Determine public education's role in creating a workforce for the digital economy.
9. Establish Web-based information resources via a Web portal that enables educators to make effective technology decisions.
10. Encourage local leadership, resource development, and community involvement for the use of technology in education.
11. Develop strategies for implementing and sustaining the goals of the ETCC.
12. Adopt the *Texas School Technology and Readiness (STaR) Chart* as the standard for K-12, and the CEO Forum's *Teacher Preparation STaR Chart* as the standard for SCDE.

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The following chart identifies the correlation between each ETCC goal and recommendation.

Recommendations	**Goal 1**	**Goal 2**	**Goal 3**	**Goal 4**	**Goal 5**	**Goal 6**	**Goal 7**	**Goal 8**
Recommendation 1	√							
Recommendation 2	√	√		√				
Recommendation 3	√			√	√		√	
Recommendation 4		√	√	√	√	√	√	√
Recommendation 5		√	√	√	√	√	√	√
Recommendation 6		√	√	√	√	√	√	
Recommendation 7	√		√	√	√	√	√	√
Recommendation 8	√	√	√					
Recommendation 9	√	√	√	√	√	√	√	√
Recommendation 10	√	√	√	√	√	√	√	
Recommendation 11	√							
Recommendation 12	√	√	√	√	√	√	√	√

The report also includes an analysis of grant awards to date for Texas schools, including E-Rate.

A more detailed description of each recommendation can be found in the chapters that follow.

COMMENDATION

The members of the ETCC commend the Legislature on this initiative. The commitment of the ETCC members has promoted improved understanding of the state's educational technology initiatives and identified shared goals.

Educational Technology in Texas

Educational Technology in Texas

BACKGROUND

Each year, more Texas classrooms are connected to the Internet and increasing numbers of students are accessing the World Wide Web and other technological innovations. Policymakers must make difficult choices among many attractive educational improvement opportunities. They must assess whether the technology works and if it is an effective tool for improving academic performance. The effectiveness of each technology solution must be weighed to ensure the successful use of technology in education.

Although research on the impact educational technology has on student achievement is in its infancy, it appears that access to technology does have a positive impact on student achievement. The Milken Exchange, a leading provider of information and research on the impact of technology on education, found that students with access to computer-assisted instruction and educational technologies show positive gains in achievement as measured by researcher-constructed tests, standardized tests, and national tests. However, Milken reports that learning technology is less effective, or even ineffective, when learning objectives and the focus of technology use are unclear.

CHARGE

The 76th Legislature, recognizing the need for a more integrated vision and planning for the cross-agency implementation of educational technology initiatives, directed the Texas Education Agency (TEA) to convene an Educational Technology Coordinating Council (ETCC) under Rider 74 to the FY 00-01 TEA Appropriations as follows:

> *The Texas Education Agency, the Department of Information Resources, the General Services Commission, the State Board for Educator Certification, the Telecommunications Infrastructure Fund Board, the State Library and Archives Commission, the Higher Education Coordinating Board and Colleges of Education shall direct a representative of their agency or institution to participate in a Education Technology Coordinating Council designed to ensure the cooperation and coordination of the state's efforts to implement educational technology initiatives. The Council is also charged with the development of a statewide master plan for educational technology. The Council shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians. Participating agencies shall share resources as necessary to provide adequate staff for the Council.*

IMPLEMENTATION

The first meeting of the Council occurred in September 1999. Members representing each named component were present, including a substantial representation for the SCDE. During the initial meeting, members discussed the scope of the ETCC. In addition, the Council governance was solidified and members established the following work groups:

- Mission Development
- Goals Development (eight workgroups; one for each goal)
- Research
- Report Development

The work groups served as a forum for brainstorming, information exchange, and open discussion outside the general meetings of the entire Council. Work group committee reports were provided at the Council meetings in December, March, June, August and October. Based on recommendations from the work groups, ETCC members established the goals, objectives and measures for the *State of Texas Master Plan for Educational Technology*.

Members also established an ETCC Web site (www.edb.utexas.edu/etcc) to facilitate information exchange.

The intent of the ETCC is to facilitate collaboration and coordination among state agencies and institutions of higher education. The ETCC also enhances the opportunities for Texas students and educators to acquire the knowledge and skills necessary for success in the digital world. The ETCC represents the interests of the state of Texas, Texas state agencies, institutions of higher education, and local education agencies to reinforce the state's efforts to implement educational technology initiatives.

GUIDING PRINCIPLES

The ETCC was guided by the following principles:

- Texas should have a unified policy direction allowing the state to address new challenges and conflicts as they arise.
- State agencies and universities must coordinate their efforts to ensure efficiency and effectiveness in achieving educational technology objectives.
- Pre-service and in-service training is essential to ensure that educators are prepared to integrate technology effectively into classrooms and educate students.
- Texas should employ a single statewide strategic plan to support a unified set of objectives for the use of educational technology in Texas.

ETCC MISSION

The Education Technology Coordinating Council (Council) is established to represent the interest of both the State of Texas and state agencies and institutions of higher education (agencies) to ensure the cooperation and coordination of the state's efforts to implement educational technology initiatives. The Council shall develop a statewide master plan for educational technology. The Council shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians. Participating agencies shall share resources as necessary to provide adequate staff for the Council.

The Council recognizes that it has a higher duty to represent the interests of the State of Texas over the individual interests of state agencies. If there are conflicts between the needs and interests of the State of Texas and the interests of any individual agency, the Council will make recommendations that consider the greater interests of the State of Texas.

More information on the ETCC Mission and Charter Statement can be found in the Appendix.

EXPECTED BENEFITS

Interagency collaborations represent one of the most challenging and important efforts in ensuring the implementation of effective educational technology initiatives. Texas state agencies must strive to develop new relationships among themselves and the constituents they serve. In short, collaboration requires change. Through collaboration, agencies may achieve economies of scale, improve the quality of service, enhance their market position or market share, and enjoy a stronger political voice. Collaboration reduces the fragmentation of services, builds a support system, coordinates services and programs more completely, combines funds for shared purposes, and increases knowledge about the needs of the educational community.

The following guidelines should be used to ensure successful collaborative efforts:

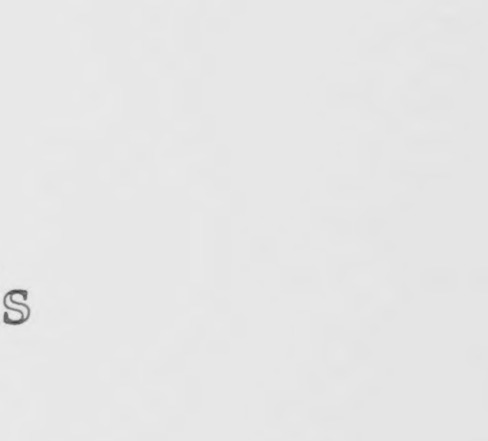
- Involve all participants so decisions and activities will receive widespread support and recognition.
- Ensure that the leadership is visionary, willing to take risks, and facilitates rather than directs change.
- Establish a shared vision and identify the expected outcomes.
- Foster the commitment to change at all organizational levels.
- Establish communication and decision-making processes that anticipate disagreement and establish ways to address conflict constructively.
- Institutionalize change by encouraging member agencies to include standardized goals in their own institutional mandates and by earmarking funds to carry out activities.
- Ensure ample time to allow agencies to establish trusting relationships with one another that will survive the difficulties associated with systemic change.

CHALLENGES

Communication is vital to implementation. Agency staffs need time to talk about ideas and plans with key stakeholders before they are implemented so that all participants are committed to the collaborative effort. The development of collaborative partnerships should not be rushed; building partnerships takes time, and the process must be nurtured on an ongoing basis.

Agencies are engaged in their day-to-day responsibilities and often lack sufficient time to coordinate and plan with other agencies. Furthermore, time commitments and staffing constraints represent an ongoing challenge. Rules and regulations of individual agencies prohibit the coordination of services, information and staff, making it difficult for staff from different agencies to work together. Differences in enterprise culture, such as prior training and socialization, pay scale and work environment may create additional obstacles. However, strong leadership can help employees understand the benefits of working collaboratively and facilitate acquisition of the skills and knowledge required for interagency collaborative efforts.

ETCC Goals



ETCC Goals

As previously noted, a central element to the successful implementation of all goals identified for the Council is the collaboration and coordination among all entities involved in providing educational technology in Texas. Each ETCC goal is detailed in the following pages.

Using parameters set forth in Rider 74 of the FY 00-01 Appropriation Act, the Goals Development Work Group met to develop and draft goals for the ETCC. A draft of the ETCC goals was presented to the Council on December 13, 1999, at which time the entire group brainstormed, defined and validated the identified goals.

GOAL DESCRIPTIONS

Each goal contains high-level information about the organizational infrastructure and data requirements necessary to measure successful implementation. As appropriate, each goal may include the following:

- *Description* provides a high-level description or discussion of the goal.
- *Definitions* clarifies terms used in the goal.
- *Level of Impact* identifies if the goal should be implemented at the state level or local level.
- *Lead Agency* names the agency in charge of overseeing the implementation of the goal.
- *Participating Agencies* names all agencies affected by the goal.
- *Objectives* identifies how each goal is to be achieved. Goals may have multiple objectives. Each objective may include the following:
  - *Lead Agency* names the agency in charge of overseeing the implementation of the objective.
  - *Outcomes/Outputs* identifies the data required to measure the result of the objective. Each objective may have multiple outcomes/outputs.
  - *Data Ownership* lists where the data resides.
  - *Sustainability* identifies measures to ensure the desired objective is maintained over time.
- *Limitations* identifies issues that might threaten the successful implementation of a goal.
- *Due Date* provides the anticipated date of implementation.

ETCC GOAL 1:

Articulate the vision for and maintain a unified policy direction among Council members to guide the creation and implementation of educational technology initiatives in Texas.

Description

The ETCC should continue to operate and develop a review process to ensure continuity of policy in the area of educational technology and to report its progress biennially to the Legislature. The ETCC goals and objectives should be integrated with member agency's strategic and operating plans.

Definition

Administrative processes include classroom management, student record keeping, etc.

Level of Impact

State level

Lead Agencies

TEA, TIF and SCDE

Participating Agencies/Entities

DIR, GSC, SBEC, TSLAC and THECB

Objective 1

Codify the *State of Texas ETCC Master Plan*, goals, and recommendations to ensure continuity of the intent of Rider 74 to the Texas Education Agency appropriation, 76th Legislature, Regular Session.

Outcomes/Outputs: Statutory language ensuring adherence to the *State of Texas ETCC Master Plan* is passed by the 77th Legislature, Regular Session, possibly in the bill patterns of all ETCC members including: TEA, DIR, GSC, SBEC, TIF, TSLAC, THECB, SCDE, and Colleges of Library Sciences.

Sustainability: Evidence in agency planning documents.

Objective 2

Codify the ETCC to be the recognized statewide coordinating forum for strategic educational technology planning in the future, continuing the development and implementation of the *State of Texas ETCC Master Plan*.

Outcome/Output: Statutory language codifying the ongoing existence of the ETCC is passed by the 77th Legislature, Regular Session, possibly in the bill patterns of all ETCC members including TEA, DIR, GSC, SBEC, TIF, TSLAC, THECB, SCDE, and Colleges of Library Sciences.

Sustainability: Evidence in agency planning documents.

Objective 3

Develop and adopt an annual plan/review process through which ETCC membership can gauge: 1) the degree to which proposed statewide educational technology initiatives are synchronous with the goals documented in the *State of Texas ETCC Master Plan* and 2) the level of coordination and collaboration of participating agencies on statewide educational technology initiatives.

Lead Agency: ETCC

Outcomes/Outputs: Formal, documented plan/review procedures are approved by the ETCC. Procedures should facilitate a cyclic process where the *State of Texas ETCC Master Plan* is updated on even-numbered years, and review of statewide educational technology initiatives are conducted on odd-numbered years, culminating in an *ETCC Biennial Report* submitted to ETCC members.

Objective 4

Coordinate with the Legislative Budget Board, DIR, and the Quality Assurance Team to ensure that ETCC goals and objectives are included in agency-specific plans, including: Agency Strategic Plan and Information Resources Strategic Plan, Legislative Appropriations Request, Biennial Operating Plan, State Strategic Plan for Information Resources Management, and Quality Assurance Review documentation. Note: for SCDE, the ETCC goals and objectives will be included in the departmental plan.

Outcome/Output: Agency plans and SCDE departmental plans include references to the *State of Texas ETCC Master Plan* indicating how each agency supports the *Plan* and the specific goals and objectives within it.

Due Date: June 1, 2001

ETCC GOAL 2:

Ensure quality pre-service and professional development to enable educators to effectively and efficiently use technology to improve student learning and administrative processes.

Description

This goal relies on efforts of SCDE, TEA and SBEC for the provision of standard exams and curriculum for new and recently accredited teachers. The requirement to demonstrate technology-related competency has clear implications for the SCDE. It should be noted that teachers certified prior to 1999 are not required to meet the proficiencies established by SBEC. It is strongly recommended that this be a local priority. It is also recommended that this be a priority for College of Education faculty as well.

Definitions

- ◇ *Educator*: Includes all teachers, librarians, counselors and administrators.
- ◇ *Pre-service Educator*: Includes individuals participating in an educator preparation program, prior to certification.

Level of Impact

State level; local level self-assessment

Lead Agencies

SCDE, TEA and SBEC

Participating Agencies/Entities

TIF, THECB and TSLAC

Objective 1

Graduating pre-service educators meet or exceed state certification standards in technology skills and content integration as established by SBEC.

Lead Agency: SBEC

Outcome/Output (state level): Percent of pre-service educators passing technology-related competencies on the Examination for Certification of Educators in Texas (ExCET).

Data Ownership: SBEC

Sustainability: ExCET data collection and reporting through August 2003.

Local Level Self-Assessment Outcomes/Outputs:

- The degree to which the educator preparation program curriculum address state standards for the technological competence of new educators.
- Evidence of technology integration in course syllabi.
- The degree to which technology is modeled in content and methods courses.
- The degree to which field experiences for pre-service educators takes place in settings in which technology integration is modeled.

Professional Development for Those Who Teach Pre-service Educators

- Formal and informal training and mentoring is available to all educators with incentives for application in teaching and research.
- The degree to which the professional development program curriculum addresses state technology standards for the technological competence of educators as established by SBEC.
- A line item in the budget for technology-related professional development for all educators.
- Incentives, time, stipends and/or personnel support are provided to enable all educators to participate in ongoing technology-related professional development.
- Local policies, access strategies and facilities are in place to support technology-related professional development for all educators via distance learning or alternative delivery systems.
- Collaborative partnerships are established to address educators' technology-related professional development.

Data Ownership: SBEC and SCDEs (for local-level assessments)

Sustainability: CEO Forum's *Interactive Teacher Preparation STaR Chart* reporting through August 2003

Objective 2

Educators meet the technology proficiencies established by SBEC.

Lead Agency: SBEC, TEA and TIF

Outcome/Output #1: Number of educators participating in technology-based professional development.

Data Ownership: ESC-based training: TEA
TIFTech training: TIF

Sustainability: ESC-based training: Data collection and reporting through August 2003
Texas STaR Chart reporting through August 2003
TIFTech training: Data collection and reporting through 2003

Outcome/Output #2: Percent of educators certified after September 1, 1999 meeting the technology proficiencies required for re-certification as established by SBEC.

Data Ownership: SBEC

Sustainability: Currently in planning stages
Texas STaR Chart reporting through August 2003

Outcome/Output #3: Percent of educators with provisional and lifetime certificates received prior to September 1, 1999 meeting the technology proficiencies required for re-certification as established by SBEC.

Data Ownership: SBEC

Sustainability: Professional development and appraisal for teacher, librarians, guidance counselors and administrators through August 2003.

Local Level Self-Assessment Outcomes/Outputs:

- Formal and informal training and mentoring are available to all educators with incentives for application in teaching and research.
- The degree to which the professional development program curriculum addresses state technology standards for the technological competence of educators as established by SBEC.
- A line item in the budget for technology-related professional development for all educators.
- At least 30% of the Technology Allotment received from the state is used for technology-related professional development for all educators.
- Incentives, time, stipends and/or personnel support are provided to enable all educators to participate in ongoing technology-related professional development.
- Local policies, access strategies and facilities are in place to support technology-related professional development for all educators via distance learning or alternative delivery systems.
- Collaborative partnerships are established to address educators' technology-related professional development.

Data Ownership: Local district

Limitations
Effective September 1, 1999, the State Board for Educator Certification issues standard certificates that must be renewed every five years. The standard certificates replace the provisional and professional lifetime certificates and will have continuing education requirements as a condition for renewal. All provisional and professional lifetime certificates issued prior to September 1, 1999, will be valid for the life of the individual unless suspended or revoked. Practicing PreK-12 teachers are subject to an annual appraisal. Approximately 90% of districts use the Professional Development and Appraisal System (PDAS) for this appraisal.

Due Date: Ongoing

ETCC GOAL 3:

Develop the leadership in planning and implementation needed to ensure effective and efficient use of the technologies made available to educators.

Description

The SCDE should have a strategic plan which addresses curriculum for educational technology for students, establishes how the effective use of technology is valued in the reward system, and the degree to which the budget of the College supports investments in technology.

Definitions

SCDE: Schools, Colleges, or Departments of Education. Includes the education unit within an institution of higher learning to identify the administrative unit responsible for educator preparation.

Lead Agency

SCDE

Participating Agencies/Entities

SBEC, TEA and TSLAC

Objective 1

Strategic planning incorporating technology includes a vision for meeting expanding goals that is built around technology as a catalyst for reform.

Lead Agency: SBEC in partnership with the Texas Association of Colleges for Teacher Education (TACTE)

Outcomes/Outputs:

- Existence of a Strategic Plan incorporating technology.
- Degree to which external constituencies, including public schools, state agencies and other appropriate community agencies, are meaningfully involved in development and monitoring of the Strategic Plan.
- Degree to which the budget and other resources are allocated by the University to the SCDE to achieve the goals and objectives of the Strategic Plan.
- Degree to which budget and other resources are allocated internally to the SCDE to achieve the goals and objectives of the Strategic Plan.
- Degree to which effective use of technologies is valued in the reward structure.
- Degree to which sufficient technology access and technical support is provided.
- Evidence of collaboration with constituent communities.
- Evidence of passing and continuously improving scores on technology portions of the Examination for the Certification of Educators in Texas (ExCET).

ETCC GOAL 3 continued

Data Ownership: SBEC

Sustainability:

- Degree to which the budget and other resources are allocated to achieve the goals and objectives of the Strategic Plan.
- Degree to which effective use of technologies is valued in the reward structure.
- Degree to which sufficient technology access and technical support is provided.
- Degree to which parent universities and THECB structure rules and guidelines to enable meaningful collaboration among SCDE and their constituent communities, e.g., public school partners, Regional Education Service Centers, state agencies, etc.

Due Date: Summer 2002

ETCC GOAL 4:

Coordinate technology-related funding processes among state agencies to provide maximum benefits to schools and teacher preparation institutions, and issue grants to maximize a coordinated effort.

Description

The TIF and TEA should coordinate their technology grants, including purpose, eligible expenditures, timelines, and categories. The TEA and TIF should have representation when either is considering grant options to ensure this coordination. The agencies should align their requirements for grantees' progress and performance reporting.

Definitions

- *Educator*: Includes all teachers, librarians, counselors and administrators.
- *Pre-service Educator*: Includes individuals participating in an educator preparation program prior to certification.

Level of Impact

State level

Lead Agencies

TIF and TEA

Participating Agencies/Entities

SCDE, DIR, GSC and TSLAC

Objective 1

Coordinate planning of TIF and TEA technology grants, including purpose, eligible expenditures, timelines, and categories.

Lead Agency: TIF and TEA

Outcomes/Outputs #1: Creation of a central source for grant coordination information:

- Timelines
- Eligibility
    - Organization
    - Expenditures
    - Activities
    - Core standards and minimum specifications

Data Ownership: Grants administered through TEA: TEA
Grants administered through TIF: TIF

ETCC GOAL 4 continued

Sustainability: Grants administered through TEA: federal budget
Grants administered through TIF: local budget

Outcome/Output #2: Common core criteria for technology plans required as part of TEA and TIF grant processes.

Data Ownership: Grants administered through TEA: TEA
Grants administered through TIF: TIF

Sustainability: Grants administered through TEA: federal budget
Grants administered through TIF: local budget

Objective 2

Coordinate grant management and reporting activities (Quality Assurance, Quality Control, and Performance Reviews) across similar constituencies to ensure that grantees successfully plan and execute their projects, and to ensure that relevant performance measures are defined, collected and analyzed.

Lead Agencies: TEA and TIF

Outcome/Output #1: Reduction of unnecessary redundancy.

Data Ownership: TEA and TIF

Sustainability: Data collection and reporting through August 2003.

Outcome/Output #2: The degree to which methodologies simplify grant processes for constituents.

Data Ownership: TEA and TIF

Sustainability: Dependent upon grant funds available from both agencies.

Limitations

Limitations and compatibility are issues inherent in rules, processes and timelines associated with funding from two very different funding sources: federal and state.

The Universal Service Fund for Schools and Libraries (E-Rate) provides discounts to schools and libraries that impact technology implementation and ongoing costs. However, eligibility for the discounts is dependent upon socio-economic level of students and receipt of discounts varies each funding year.

Due Date: Ongoing

ETCC GOAL 5:

Help educational institutions understand the resources that are available and the most beneficial ways to use them.

Description

The TEA and TIF will aggregate materials that will help schools request grants, informing schools on what grants, including E-Rate, are complementary and might be jointly awarded. This material should be available through a Web portal that is non-agency specific.

Definitions

- *Educator*: Includes all teachers, librarians, counselors and administrators.
- *Pre-service Educator*: Includes individuals participating in an educator preparation program, prior to certification.

Level of Impact

State level

Lead Agencies

TEA and TIF

Participating Agencies/Entities

SCDE and TSLAC

Objective 1

Provide a Web-enabled repository of resources.

Lead Agencies: TEA and TIF

Outcomes/Outputs: Availability of resources that enable schools and their partners to make effective technology decisions through the entire spectrum of activities, from planning through procurement, implementation and sustainability, in order to create and support technology infrastructure, professional development and the integration of applications.

- Funding (TIE, TIF, federal grants, foundations, etc.)
- Handbooks and guides
- Best practices white papers
- Standards and minimum specifications
- Training and professional development:
    - Distance learning
    - Integration of technology into traditional classrooms
    - Technology planning
    - Administrative applications
    - Technology support

ETCC GOAL 5 continued

Data Ownership: TEA and TIF

Sustainability: Existing data collection through August 2003. Collection of new, additional data needed.

Limitations

Increased budget and processes needed to collect and maintain data and resources beyond those currently in place.

Due Date: Summer 2001

ETCC GOAL 6:

Identify and develop profiles and select and disseminate exemplary practices of technology infrastructures within the state.

Description

A Web-based repository for best practices will require that all agencies agree upon a definition of success. Best practices should include strategies for post-implementation sustainability.

Level of Impact

State level

Lead Agency

TIF

Participating Agencies/Entities

TEA, DIR, GSC, SBEC, TSLAC, THECB and SCDE

Objective 1

Develop a Web-based database accessible by schools and libraries in order to promote coordination and collaboration and to assist them in building their own infrastructure. This database would include a current map and profile of all existing educational telecommunications infrastructures in the state.

Lead Agencies: TIF, DIR, GSC and TEA

Outcomes/Outputs:
- Development of a database.
- Review of database information by participating entities.
- Establishment of a feedback mechanism.
- Use of the database by clientele.
- Records of access by clientele.
- Amount of information utilized by TPG and TIF clientele.
- High-level information included in plans and traceable back to an agency.
- Number of clientele using TEXAN.
- Percent of actual TEXAN users of total GSC eligible.
- Percent of actual users and eligible entities.

Data Ownership: TIF, DIR, GSC and TEA

Sustainability:
- Develop process for refreshing information.
- Refresh every 2 years with the agency plan process.
- Number of clientele using TEXAN.
- Number of clientele connected.

Objective 2

Technology infrastructure and resources best practices are identified and disseminated.

Lead Agencies: TIF and TEA

Outcomes/Outputs:

- Measures of the degree to which there are bridges and interconnectivity between educational technology infrastructures in the state.
- Measures of the degree to which upgrades of hardware and software take place on a timely rotation schedule.
- Actual use of database.
- Feedback gathered from clientele.
- Usage by agency.
- Use by GSC eligible entities.

Data Ownership: TIF and TEA

Sustainability: Refresh repository.

Limitations

Personnel and resources.

Due Date: Summer 2001

ETCC GOAL 7:

Promote a minimum level of technology access and use in the state's local education agencies and teacher preparation institutions.

Description

Define the minimum standards and survey to establish a benchmark. Strategies should be developed to address institutions that don't meet the minimum standards.

Level of Impact

State level; local level self-assessment

Lead Agency

TEA and SCDE

Participating Agencies/Entities

DIR, GSC, SBEC, TIF, TSLAC and THECB

Objective 1

Teachers, faculty, and students have access to advanced productivity tools, online services, media-based instructional materials and primary sources of data in settings that enrich and extend their learning goals. Access should be sufficient to prepare students to be effective learners and educators to be effective teachers.

Lead Agencies: TEA and THECB

Outcome/Output #1: Level of Internet access.

Data Ownership: TIF and THECB

Sustainability: Data collection and reporting through August 2003.

Outcome/Output #2: Availability of data for decision-making.

Data Ownership: TEA and THECB

Sustainability: Data collection and reporting through August 2003.

Outcome/Output #3: Availability of media-based instructional materials.

Data Ownership: TEA and THECB

Sustainability: Data collection and reporting through August 2003.

ETCC GOAL 7 continued

Outcome/Output #4: Degree to which funding from all sources provides equitable access to sufficient technology resources.

- Formula funding for technology: Technology Allotment
- Needs-based technology funding: TIE, TIF and other grants

Data Ownership: TIF, TEA and THECB

Sustainability: Data collection and reporting through August 2003.

Outcome/Output #5: Level of access to technology infrastructures, especially teleconferencing networks.

Data Ownership: TIF and THECB

Sustainability: Data collection and reporting through August 2003.

Outcome/Output #6: Number of SCDE that meet the minimum standards for technology access.

Data Ownership: THECB, SCDE and SBEC

Sustainability: Data collection and reporting through August 2003. Collection of new, additional data needed.

Local Level Self-Assessment Outcomes/Outputs:

- Student to computer ratios.
- Teacher/faculty to computer ratios.
- Degree to which K-12 students demonstrate proficiency in Technology Applications Texas Essential Knowledge and Skills (TEKS.)
- Degree to which teachers/faculty demonstrate proficiency as indicated by SBEC standards.

Data Ownership: Local districts

Sustainability: *Texas STaR Chart* reporting

Limitations

Increased budget and processes needed to collect and maintain data and resources beyond those currently in place.

Due Date: Summer 2001

ETCC GOAL 8:

Promote interoperability of technology resources and processes to derive maximum benefits for state and local investments in technology resources.

Description

To the extent possible, grant monies should be invested in technologies that ensure interoperability, longevity and performance. Adherence to state and national standards can contribute to these objectives.

Level of Impact

State level; local level

Lead Agency

DIR

Participating Agencies/Entities

GSC, TEA, TIF and TSLAC

Objective 1

The following standards have been identified and adopted for applicable technologies:

- Projects involving technology will be based on open standards.
- Projects involving technology shall use applicable current national and international standards.
- Projects involving technology shall adhere to DIR and TIF (for grants) standards and guidelines.
- Projects involving technology will be ADA compliant, when appropriate.

Lead Agencies: DIR, TSLAC, TIF and TEA

Outcomes/Outputs:

- Degree to which standards have been identified and adopted for technology applications (i.e., Video - H.320, etc.).
- The use of adopted standards is indicated in agency operating plans.
- RFPs released by TEA, TIF, and TSLAC will contain adopted standards.
- Degree to which projects are ADA accessible.
- Standards are promoted for inclusion in technology projects.
- Technology standards are in congruence across agencies adopting standards.
- Agency plans and QAT Process.
- Library plans and agency plans Records Management Interagency Coordinating Council (RMICC).
- Inclusion in grants and grant review process.

Data Ownership: DIR, TSLAC, TIF and TEA

Sustainability: Standards Review Process.
Up to grantee for future applications.
Monitors connectivity for Texas Education Telecommunications Network (TETN) access.

__Objective 2__

If needed, projects involving technology shall be able to interoperate with other state-sponsored projects.

Lead Agencies: DIR, TSLAC, TIF and TEA

Outcomes/Outputs:

- Degree to which projects involving technology could be accessible across the state as needed.
- Processes to test for interoperability are published for existing state projects.
- Resources are identified in Goal 6 that need to interoperate and their manageability.
- Agency Plans and Biennial Operating Plans, use of TEXAN and standards by SAO.
- Grant review processes.
- Access to TETN.

Data Ownership: DIR, TSLAC, TIF and TEA

Sustainability: State funding
Individual case basis (grantee)

__Objective 3__

Agencies implementing projects involving technology have staff trained in applicable state standards and guidelines, and the agencies are cognizant of statewide efforts.

Lead Agencies: DIR, TSLAC, TIF and TEA

Outcomes/Outputs:

- Agencies' projects indicate the presence of knowledgeable staff on DIR standards and guidelines and staff are cognizant of other similar projects within the state.
- State grant requests for proposals (RFPs) require the training of knowledgeable staff in RFP responses and staff are cognizant of other similar projects within the state.
- Identifying the need for technical competency of agencies.
- Grant review processes for applicable grants.

Data Ownership: DIR, TSLAC, TIF and TEA

ETCC GOAL 8 continued

Sustainability: Report on meeting Information Resource Manager requirements to LBB Initial review of applicable grants

Each grantee's responsibility

Limitations

DIR rules and guidelines apply only to state agencies and universities. Local school districts and ESCs are not bound by these standards, however they can be affected by the grant process.

In addition, there is no enforcement mechanism for ensuring that the rules are followed other than an audit review of the grant awards.

Due Date: Ongoing

FISCAL IMPACT

The costs involved in the work of the ETCC to date have been absorbed by each agency participating in the ETCC. Implementation of the goals established by the ETCC will result in incremental increases in cost and demands on staff time. The fiscal impact of each goal is not estimated at this time. The ETCC will provide a fiscal estimate on any item presented in this report.

Implementation Strategies

Implementation Strategies

The goals established for the ETCC provide the basis for comprehensive planning for educational technology initiatives, setting the direction and tone for coordination and collaboration in Texas. The recommendations in this report serve as an implementation plan for achieving statewide collaboration on educational technology.

***Recommendation 1**: Amend Rider 74, House Bill 1, 76th Legislature to continue the Education Technology Coordinating Council or successor group, and include Rider 74 in the bill pattern of each participating agency.*

The ETCC will expire at the end of the 2000-2001 biennium. A governing/oversight process for continuing the development and implementation of the *State of Texas Master Plan for Educational Technology* should be established. Continuation of the process may also result in an expansion of the goals and objectives of the group as progress continues in the collaborative process.

Rider 74 of TEA's Appropriation should be adopted by the 77th Legislature as follows:

> *The Texas Education Agency (TEA), Department of Information Resources (DIR), General Services Commission (GSC), State Board for Educator Certification (SBEC), Telecommunications Infrastructure Fund (TIF) Board, State Library and Archives Commission (TSLAC), Higher Education Coordinating Council (HECB), schools, colleges, or departments of education (SCDE), and the Colleges of Library Science (CLS) shall ensure that their Agency Strategic Plans adhere to and support the State of Texas Master Plan for Educational Technology prepared by the Education Technology Coordinating Council (the Council) under the provisions of Rider 74, House Bill 1, 77th Legislature.*
>
> *The TEA, DIR, GSC, SBEC, TIF, TSLAC, HECB, SCDE, and the CLS shall direct a representative of their agency or institution to participate in the Council. The Council shall ensure the coordination of the state's efforts to implement educational technology initiatives.*
>
> *The Council is charged with the continuing development and maintenance of the State of Texas Master Plan for Educational Technology and submitting an updated Master Plan to the Legislature in December of every even-numbered year. The Plan shall articulate the vision and maintain the unified policy direction to guide the creation and implementation of education technology initiatives in Texas.*
>
> *The Council shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians.*
>
> *Participating agencies shall share resources as necessary to provide adequate staff for the Council.*

Rider 74 should be included in the bill pattern of the Texas Education Agency, the Department of Information Resources, the General Services Commission, the State Board for Educator Certification, the Telecommunications Infrastructure Fund Board, the Texas State Library and Archives Commission, and the Higher Education Coordinating Board to ensure coordination of educational technology initiatives in the State of Texas.

***Recommendation 2**: Continue coordination among the Telecommunications Infrastructure Fund Board,Texas Education Agency and Texas State Library grant processes.*

Current grant processes require TEA and TIF grant applicants to list other grants received. More scrutiny may be needed to ensure TEA, TSLAC and TIF grants complement each other. A process among the agencies should be developed to ensure grant award/distribution and development coordination.

***Recommendation 3**: Identify E-Rate funding recipients and assist non-participants in securing funding.*

The federal E-Rate program has provided over $262 million in the program's first two years to school districts and libraries in the state. Of this amount, a total of $84 million the first year and $87 million the second year can be attributed to the top beneficiaries (school districts/consortium) receiving amounts greater than $500,000 each. This includes 28 school districts in the first year and 38 districts in the second. The remaining $89 million was distributed over two years to the rest of the state's school districts and libraries (911 applications in Year 2 alone). The ETCC should facilitate an effort to assist districts and libraries not receiving funding. Additionally, E-Rate funding should be mapped to state grants distributions in order to determine the impact and benefits of these awards. This analysis would identify who received E-Rate funding and the impact or benefits of this funding.

***Recommendation 4**: Develop a process for the SCDE to infuse technology within teacher education.*

A grant for the SCDE should be implemented to assist them with infusing technology throughout all aspects of teacher preparation and ensure that all new educators meet the state teacher technology standards. The grant should be developed by the SBEC in conjunction with TEA, TIF and the SCDE of each state university.

***Recommendation 5**: Develop a process for Colleges of Library Sciences to infuse technology within librarian education.*

A grant for the Colleges of Library Sciences should be implemented to assist them with infusing technology in librarian education and ensure all new librarians have a minimal level of competency in technology. The grant should be developed by the Texas State Library in conjunction with the TIF and the Colleges of Library Sciences of each state university.

***Recommendation 6**: Identify models and strategies to provide opportunities for in-service educators to meet the technology proficiency benchmarks as established by SBEC.*

SBEC has defined standards for continuing education in technology applications; however, there is a need for a professional development framework that identifies models and strategies to guide the experienced educator in the integration of educational technologies throughout the curriculum. This framework would meet the needs of educators with varying levels of technology competency and content expertise and leverage the professional development opportunities available through various providers.

***Recommendation 7**: Establish minimum standards for technology sustainability at schools and libraries.*

Minimum standards for technology sustainability should be published that encourage a minimum level of technical proficiencies in order to implement and support internal technology for the classrooms. If the skills cannot be located among the district staff, contracted services should be encouraged. Minimum competency standards should include:

- A technology sustainability plan addressing both financial and organizational issues
- Skill sets for staff in information resources departmental areas
- Standards for equipment used within districts
- Technology planning and contract management skills
- Interoperability requirements

***Recommendation 8**: Determine public education's role in creating a workforce for the digital economy.*

The *Governor's Vision* states that the children of the state should receive the knowledge and skills for the next century. The knowledge and skills should include the use of technology required in today's workforce. Targeted funding is needed to assist school districts with the implementation of Technology Application courses at the secondary level. TEKS and other career and content areas should be fully implemented in all school districts to ensure opportunities for students to acquire skills in areas in which there are shortages within the digital workforce. Partnerships with business and industry to expand Tech Prep and Technology Education programs should be encouraged.

***Recommendation 9**: Establish Web-based information resources via a Web portal that enables educators to make effective technology decisions.*

Projects to establish Web-based resources for educational information should be established and funded. These programs should be implemented under the direction of SBEC, TEA, TIF and TSLAC. The Web sites would dedicate content to the following:

- Information on distance learning courses (offered and received), curriculum enhancement and professional development opportunities related to education and technology.
- Access to other Web-based resources of state agencies related to education and technology.

***Recommendation 10**: Encourage local leadership, resource development, and community involvement for the use of technology in education.*

The development and sustainability of technology projects and the use of technology in education programs require a level of support in the local community that cannot be provided at the state level. State programs should encourage and continue to seek opportunities to enhance technology leadership at the local level.

***Recommendation 11**: Develop strategies for implementing and sustaining the goals of the ETCC.*

As a next step, the ETCC should begin to identify and develop strategies for implementing the goals established by the group. Strategies should not only target state level implementation, but also implementation of these goals at the local level.

***Recommendation 12**: Adopt the Texas STaR Chart as the standard for K-12, and the CEO Forum's STaR Chart as the standard for SCDE.*

The CEO Forum on Education and Technology, founded in 1996, is a unique partnership of business and education leaders who work together to monitor the nation's progress towards ensuring that today's students will be equipped with the skills they need to be contributing citizens and productive workers in the 21st century.

In 1997, the CEO Forum released its first report, the *School Technology and Readiness (STaR) Report: From Pillars to Progress,* which included the first STaR Chart and STaR Assessment. This report included indicators in hardware, connectivity, content, and professional development. The most significant progress has been in the areas of hardware and connectivity. In 1999, the second report, *Professional Development: A Link to Better Learning,* brought the spotlight to the effective use of technologies through the training of teachers.

Since then, the Forum turned its focus to the critical pillar of teacher preparation. The CEO Forum's *Interactive Teacher Preparation STaR Chart* is a self-assessment tool designed to enable SCDE to assess their level of readiness in preparing teachers to use technology. Teacher preparation institutions across the country have adopted the chart.

In June 2000, the CEO Forum released the third report, *The Power of Digital Learning: Integrating Digital Content,* to provide practical guidelines and tools educators can put to work in their schools to realize the full potential of the technology infrastructure now in place.

The STaR Chart identifies and defines four evaluative profiles ranging from the "Early Tech" program with little or no technology use, to the "Target Tech" program that provides a model for the integration and innovative use of educational technology. The STaR Chart is not intended to be a measure of any particular program's technology readiness, but rather to serve as a benchmark against which every institution can assess and track its own progress.

The TEA's Educational Technology Advisory Committee (ETAC) has reviewed a variety of tools currently in use across the nation. The committee is adapting the work of the CEO Forum to meet the needs of Texas school districts and provide a tool to help them clarify goals and measure progress toward implementing the *Long Range Plan for Technology, 1996-2010.* As a result of this effort, ETAC has developed the *Texas STaR Chart* to be piloted during the 2000-2001 school year.

The ETCC recommends the *Texas STaR Chart* and the CEO Forum's *Interactive Teacher Preparation STaR Chart* serve as the standard for assessing technology preparedness in Texas.

Investing in Texas

Investing in Texas

Texas has made a substantial investment over the past decade in educational technology. During the 1998-99 biennium, in addition to $50 million in federal funds, Texas spent more than $600 million in state funds on educational technology and telecommunications infrastructure. It should be noted that these figures do not include money spent on educational technology at the local level.

Through the Texas Education Agency, federal technology grants, rate reduction plans, and TIF's $1.5 billion investment over 10 years to provide telecommunications access, Texas has committed resources to implement a telecommunications infrastructure that will improve education. The agencies involved with planning and implementing educational technology in Texas are discussed below.

TELECOMMUNICATIONS INFRASTRUCTURE FUND BOARD

The Telecommunications Infrastructure Fund (TIF) Board was created in 1995 during the Regular Session of the 74th Legislature by enactment of House Bill 2128. TIF is charged with deploying a statewide telecommunications infrastructure. To meet this charge, TIF will disburse approximately $1.5 billion in revenues through fiscal 2006 through a formal grants program to its four constituencies – public schools, public libraries, higher education institutions, and non-profit healthcare facilities.

Since fiscal 1997, grant dollars awarded by TIF increased by an average rate of 67% per year through fiscal 2001, while the number of grantees has grown by an average of 118% per year. In fiscal 2001, TIF will manage about $366 million in grant dollars and approximately 5,000 grantees through its various programs.

Initially, TIF established Internet connectivity as the primary focus of its grant programs. According to the *TIF Master Plan*, once basic access has been achieved, funding priorities will shift to more innovative telecommunications projects. TIF's current vision, therefore, is to increase Texans' access to advanced telecommunications technologies, while funding progressive applications of technology projects. The telemedicine, distance learning, collaborative demonstration, and community networking grants reflect TIF's evolving vision.

TEXAS EDUCATION AGENCY

The Texas Education Agency (TEA) provides leadership and support in the use of technology through a wide variety of technology initiatives that provide Texas students, parents, teachers, administrators, legislators, and business leaders access to the tools, products, and information they need to make decisions, to educate, to plan, and to learn. These technology initiatives collectively comprise the Public Access Initiative, which is the Agency's strategy for implementing the *Long-Range Plan for Technology* (LRPT). Each of these initiatives is highlighted below.

Technology Allotment

In 1992, all school districts in Texas began to receive a Technology Allotment of $30 per student, per average daily attendance (ADA) for the purchase of technology in support of the goals of the LRPT. The original statute provided for an increase in the Technology Allotment by $5 per ADA to a cap of $50 per ADA. As a result of revisions to the statute in 1995, the Technology Allotment remains at the initial $30 per ADA. Through the Technology Allotment, school districts across the state have a baseline resource with which to develop and expand their existing technology programs and to provide technology training. Schools use the allotment for hardware, software and training.

Technology Applications TEKS

A comprehensive K-12 curriculum that specifically focuses on teaching and learning technology skills and the use of computers and other related electronic tools was implemented in 1997-1998, for the first time in Texas history. This curriculum, called Technology Applications, is specified in the Texas Education Code, §28.002 as a required enrichment curriculum area. The Technology Applications Texas Essential Knowledge and Skills (TEKS) were written to provide rigorous standards at all grade levels as well as flexibility for schools.

All high school graduates are required to have one Technology Applications graduation credit under all graduation plans. The SBOE has approved 17 courses to count for the Technology Applications graduation credit. All eight courses in Technology Applications TEKS, Chapter 126, receive this credit. In addition, there are courses in Career and Technology Education that can also count for this credit.

Resources for teaching and learning the Technology Applications TEKS and for integrating these TEKS across curriculum areas have been developed and compiled by the Technology Applications Center for Educator Development (CED), housed at the University of North Texas. These resources can be accessed from the TEA Web site.

In addition, technology has been integrated throughout TEKS for all subject areas. The TEKS specify that technology is integral to all content areas and grade levels. As a result, technology is infused into all curriculum areas, K-12, in a structured, organized and systematic manner and student proficiencies are clearly articulated.

The State Board of Educator Certification, with assistance from TEA, is currently developing technology proficiencies, certification standards, and assessment instruments for all Texas educators. SBEC approved Technology Applications standards for beginning teachers in May 2000. Technology Applications standards and certificate fields for Grades 8 through 12 beginning educators were adopted by SBEC in October 2000.

Education Service Center Technology Preview Centers and Training Programs

Technology Preview Centers and Training Programs have been established at all 20 regional education service centers (ESCs) in Texas to provide school districts with educational technology services that enhance efficiency, effectiveness and the performance of students, teachers, administrators and school personnel. The ESCs provide planning, consultation, professional development and technical assistance in response to district needs and in support of the state's *Long-Range Plan for Technology*. The TEA's Educational Technology Division provides financial support to the ESCs to assist them in these endeavors. Program outcomes of the Technology Preview Centers and Training Programs include:

- Development of collaboratives and partnerships
- Regional network development and operation
- Education Resources Preview Center
- Training and professional development services
- Texas Library Connection support
- Planning and grant development
- Distance learning opportunities

Texas Library Connection

The mission of the Texas Library Connection (TLC) is to ensure that all citizens of its school communities are provided current, relevant information resources regardless of a district's size or geographic location. This mission is accomplished by:

- Providing an integrated, statewide resource sharing system through which needed information resources are identified, accessed, and retrieved.
- Facilitating library administrative services and local collection development.
- Providing appropriate electronic full text journals and newspapers and other informational databases.
- Enhancing the ability of participating libraries to contribute to and participate in local, state, and national resource-sharing initiatives, including the academic library statewide initiative, TexShare, and the public library statewide initiative, Texas State Electronic Library.

Through enrollment in TLC, participating campuses provide, from their school libraries, their classrooms, and homes of their students and educators, information resources valued at more than $20,000 per campus. Those resources include:

- More than 44 million books, videos, and computer software programs available through inter-library loan from the libraries of schools that are participating in TLC.
- The full text of more than 16,000 government documents through the TLC Union Catalog.
- The full text of more than 1,300 magazines, journals, and newspapers.
- References and primary source information resources related to Texas Essential Knowledge and Skills.
- Encyclopedic articles linked to Web sites evaluated by the editors of *Encyclopedia Britannica*.

Currently, 4,167 campuses representing 2.8 million students are participating in the Texas Library Connection.

EdTech PILOTS—Providing Increased Learning Opportunities for Texas Students

The TEA is conducting educational technology pilots at 13 sites that represent a cross section of Texas elementary, middle and high schools across the state. The primary objective of these pilots is to examine the effectiveness of using various technologies to deliver substantial curriculum content to students and to improve student learning.

The pilots will examine the cost and efficacy of using technology to deliver curriculum that has traditionally been delivered through print media. The pilots draw on various technologies and involve hardware and curriculum products from numerous vendors.

The TEA has $2.25 million available for this two-year project. The funds serve as support for the school districts selected to participate in the pilots. Awards, selected through a peer review process, were announced in January 2000.

Results from the pilots will highlight data related to the impact on students, teachers, campuses, families, and communities as well as data on the cost and benefits of using the technologies and content.

The Educational Technology Advisory Committee

The Educational Technology Advisory Committee (ETAC) was created to work in an advisory capacity to increase the equity, efficiency, and effectiveness of student learning, instructional management, staff development, and administration. The latest efforts of this committee are focused on the development, implementation and evaluation of technology guidelines to provide districts with the tools for self-assessment that will aid in effective integration of technology across the curriculum.

The ETAC is adapting the nationally respected CEO Forum's *School Technology and Readiness (STaR) Chart* to meet the needs of Texas school districts and provide a tool to help clarify goals and measure progress. The *Texas STaR Chart* can be used to assist districts in determining their needs and begin the process of moving towards Target Tech teaching and learning. The *Texas STaR Chart* will be field tested in spring 2001 and is expected to be available to schools the following fall.

The Technology Literacy Challenge Fund

The goal of the Technology Literacy Challenge Fund (TLCF), a federally funded program, is to stimulate local, state, and private sector partnerships focused on fully integrating technology into teaching and learning to ensure that all students are technologically literate by the beginning of the 21st century.

The TLCF funds are used to advance the national and state long-range plans for technology. The four goals of the national plan are:

- All teachers will have the training and support they need to help students learn through computers and through the information superhighway.
- All teachers and students will have computers in their classrooms.
- Every classroom will be connected to the information superhighway.
- Effective and engaging software and online curriculum will be an integral part of every school curriculum.

Technology Integration in Education

The Technology Integration in Education (TIE) initiative implements the federal TLCF program at the state level. It addresses the national goals and supplements the recommendations of our state's Public Access Initiative and the *Long-Range Plan for Technology*, in the areas of Teaching and Learning, Educator Preparation and Development and Administration and Support Services.

Funds are awarded through a competitive sub-grant process. A total of $33 million is available for fiscal 2000.

Universal Service Fund for Schools and Libraries

The federal Universal Service Fund for Schools and Libraries, more commonly referred to as E-Rate, provides discounts on telecommunications services to schools and libraries. Discounts range from 20% to 90% based on the number of students eligible for the federal school lunch program. Texas schools are realizing significant benefits through E-Rate discounts.

Schools must have an approved technology plan in order to be eligible to participate in the E-Rate program. The TEA is the official approving agency for public schools in Texas. In Year 1, 812 school district plans were approved during a peer review process for one, two, or three years. If plans were disapproved, Agency and education service center staff worked with districts to correct deficiencies until the plans met the required criteria and could be certified. In Year 2, 281 school district plans were approved for one, two, or three years and in Year 3, 389 plans were approved.

To participate in year four of the program, many districts will need to revise and resubmit their technology plan since plans could only be certified for three years. The Agency is exploring various electronic methods of receiving and certifying technology plans for E-Rate to lessen the paperwork required of school districts and education service centers.

Texas Education Telecommunications Network

The Texas Education Telecommunications Network (TETN) is a statewide educational network providing compressed, two-way video/audio videoconferencing, audio communications, and data transfer capabilities between the TEA and all 20 regional ESCs via dedicated T1 lines.

The purpose of TETN is to facilitate communications among these key educational entities throughout the state and to make it possible for more information, training, and data to be shared while simultaneously reducing costs and time lost due to travel.

The TETN is used for electronic meetings and panel discussions, professional development and training, for-credit courses, Public Education Information Management System (PEIMS) data and computer files transfer.

The TETN network is in the process of migrating from a T1 environment to an Asynchronous Transfer Mode (ATM) environment to increase the capabilities of the network and reduce telecommunications service charges. Additional enhancements to the TETN will include:

- Connection to the intra-regional networks of all 20 ESCs.
- Additional capability to dynamically reallocate bandwidth based on demand.
- Data encryption to enhance security.

Texas School Telecommunications Access Resource

The Texas Schools Telecommunications Access Resource (T-STAR) is a statewide telecommunications initiative that provides television communications (one-way video/two-way audio via satellite) to school districts, regional ESCs and the TEA. T-STAR delivers a wide choice of distance learning opportunities from TEA and programming providers across the U.S.

Texas students and educators can use T-STAR to expand their curriculum and educational resources through satellite-delivered for-credit courses, K-12 curriculum enhancement programming and electronic field trips, and professional development teleconferences from programming providers across the country. They can also access six hours of programming per week that is broadcast from TEA.

More and more satellite-based distance learning providers deliver their services via digital broadcast. As the satellite industry undergoes a major shift from analog to digital service, T-STAR is also transitioning to digital. To enable Texas schools to take advantage of these digital educational resources and expand the capabilities of the existing T-STAR satellite network, the TEA has:

- Installed a digital uplink at the site of the T-STAR Network television studio.
- Upgraded the television equipment in the T-STAR Network studio.
- Expanded the capabilities of T-STAR satellite systems to receive digital as well as analog signals at all 20 ESCs and five school district sites.
- Conducted a pilot program with the TEA, Region 20 Education Service Center and Crystal City ISD to explore the potential of integrating the T-STAR broadcast to desktops over local WANS and LANS.
- Provided information and training regarding converting existing T-STAR satellite systems at school districts.

Texas school districts are encouraged to convert their analog-only T-STAR dishes to receive both digital and analog transmissions. Among their options, districts can take advantage of existing funding opportunities such as their Technology Allotment dollars or apply for a grant through the TIE program administered by the TEA.

During the transition period, programming from the TEA will be broadcast in both analog and digital formats in order to give districts time to convert their T-STAR satellite dishes to digital.

TEXAS STATE BOARD FOR EDUCATOR CERTIFICATION

The State Board for Educator Certification (SBEC) was established by the 74th Texas Legislature in 1995 to ensure the highest level of educator preparation and practice for achieving student excellence. To accomplish this, the Board is in the process of designing a system for educator preparation and certification that assures the public that only fully certified educators are employed in public school positions for which certification is a requirement.

TEXAS STATE LIBRARY AND ARCHIVES COMMISSION

The Texas State Library and Archives Commission (TSLAC) operates a host of electronic reference and research systems, as well as resource sharing programs. A significant amount of education-related information is made available electronically through the Commission, including the following:

- The Texas State Electronic Library is a selection of online databases for public libraries and government agencies. This service provides public library users and Texas state government agency personnel access to proprietary indexes, journal articles, book chapters, and reference resources.
- TexNet is a statewide interlibrary loan network including academic, public and special libraries throughout Texas that enables a library's patrons to access materials not available locally.
- TexShare supports and enhances resource sharing among Texas libraries by allowing academic and public libraries to share their combined resources and collections with all Texans.
- The Texas Records and Information Locator Service (TRAIL) provides a link to state government electronic publications available on the Internet.

GENERAL SERVICES COMMISSION

The General Services Commission (GSC) administers the state's telecommunications system, TEX-AN, which is used by state government, as well as higher education institutions and public education. TEX-AN 2000 is a comprehensive database of telecommunications-related contracts awarded by GSC to facilitate the procurement of telecommunications services. More than 20 separate services were awarded to over 20 different companies. Each contract identifies a particular service and set of prices offered by a single vendor.

DEPARTMENT OF INFORMATION RESOURCES

The Department of Information Resources (DIR) is the primary information resource agency for Texas. As a technology leader in the State of Texas, the DIR serves as a catalyst for improvement by influencing technology decisions and ensuring the most appropriate uses of information resources. DIR is charged with providing leadership and coordination of information resources for state agencies and universities.

THE TEXAS HIGHER EDUCATION COORDINATING BOARD

The Texas Higher Education Coordinating Board (THECB) was established to provide unified planning and development for the state's higher education institutions. THECB's responsibilities for coordination encompass public universities, community colleges, technical institutes, medical schools, and other allied health units. The Board provides statewide leadership to achieve excellence in college education through efficient and effective use of resources and to eliminate unnecessary duplication of program offerings, faculties, and campus facilities.

SCHOOLS, COLLEGES, DEPARTMENTS OF EDUCATION

The term Schools, Colleges, Departments of Education (SCDE) is used to represent the academic unit on a college or university campus that oversees teacher education degrees and programs. In Texas, there are 69 higher education entities that prepare educators. Approximately half are state institutions and half are private.

ANALYSIS OF GRANT AWARDS

Texas schools are using a variety of federal, state and local funds to implement technology. State and federal funding sources use a variety of criteria for awards. All Texas school districts and open-enrollment charter schools receive the $30 per student state-funded Technology Allotment each year. The allotment can be used only to *"purchase electronic textbooks or technological equipment that contributes to student learning; and pay for training educational personnel directly involved in student learning in the appropriate use of electronic textbooks and for providing for access to technological equipment for instructional use."*

Since its creation in 1995, the TIF Board has awarded grants to 99% of all school districts in the state. Public school grants are awarded on a non-competitive basis and are targeted to meet the needs of individual campuses within districts. While nearly all districts have received grant funds, additional grants are planned to meet the infrastructure needs of all campuses.

The federal Universal Service Fund for Schools and Libraries, more commonly referred to as E-Rate, provides discounts to schools and libraries on telecommunications services. Discounts range from 20% to 90% on eligible services. The discounts are based on the number of students eligible for the federal school lunch program. The Schools and Library Division (SLD) of the Universal Service Administrative Company (USAC) administers E-Rate with oversight from the Federal Communications Commission (FCC). During the first two years of the E-Rate program, 70% of Texas school districts received the discounts. Commitments to schools for Year 3 are currently underway.

The federal Technology Literacy Challenge Fund (TLCF) provides resources to promote the four goals of the National Educational Technology Plan. TEA administers the competitive grant program known as Technology Integration in Education (TIE) to distribute TLCF funds in Texas to support the *Long-Range Plan for Technology, 1996-2010*. During the first four years of the TIE program, funds have been awarded to 66% of Texas school districts through direct awards or collaborative arrangements.

FUNDING SOURCE	**FUNDING TYPE**	**FUNDING LEVEL**
Technology Allotment (state)	Formula funding at $30 per student	100% of all districts, annually
TIF (state)	Non-competitive grants based on campus needs	99% of all districts in first five years of the program
E-Rate (federal)	Discounts based on % of economically disadvantaged students	70% of districts in first two years of the program
TLCF/TIE (federal)	Competitive grants	66% of districts in first four years of the program

COLLABORATION EFFORTS

Texas has made significant strides in the funding and implementation of educational technology initiatives statewide. However, providing access to educational technology resources on a statewide basis is an immense technological and financial challenge for the citizens of Texas. The geographic size and diversity of the state, the size and diverse needs of the population to be served, and the complexity of the state's checkerboard telecommunications landscape present a formidable undertaking. The time and resources required to provide the professional development opportunities and the time for practice and professional collaboration necessary to re-tool a statewide workforce of K-16 education professionals are great.

TEA and TIF Ensuring the Effective use of the Texas Library Connection

Last spring, the Texas Education Agency contracted with EGS Research & Consulting to survey campuses participating in TLC to determine factors leading to the successful implementation of that statewide technology initiative. The survey was completed in June 2000. In addition, 317 districts that had never submitted applications to participate in the TLC were surveyed to learn why they had not applied. Eighty-six percent of the non-participating districts are rural. Sixty-four percent have fewer than 500 students. Results from the survey indicated that the primary reason these districts could not participate in TLC is that their libraries were not automated. The TIF's Library Working Group recognized that these specific libraries needed assistance to provide their students equitable access to TLC resources. On May 22, 2000, TIF announced the availability of funding through a non-competitive process to provide technology advancement to Texas public school libraries. The main focus of this grant initiative is to ensure that campus libraries have sufficient telecommunications infrastructure so students and staff have full access to all TLC resources.

Eligible applicants are Texas public school districts that have campus libraries that are not currently members of TLC for one or more of the following reasons:

- Have no Internet connectivity in the library.
- Have limited Internet connectivity due to insufficient workstations for student access or an inadequate Internet connection.
- Lack a library automation system with Machine Readable Cataloging (MARC).

More than 200 campuses sent notices of intent to apply for the non-competitive grant (LB5). Ultimately, 155 schools submitted an application. All 155 were funded for a total of $7,619,470. Under the grant, eligible schools could fund up to two libraries at $35,000 per library. Schools could also qualify simultaneously for the current Public School Technology Advancement and Distance Learning (PS8) grant. The ultimate goal of these grant initiatives is to make every campus in the state eligible for TLC membership. TIF recognizes that it can supply the required elements of TLC membership. Joint TETN videoconferences with TIF and TEA staffs have assisted regions with first implementation steps for the Public School Library grants. The non-competitive nature of the grants makes it much easier for smaller districts that lack the human resources of larger districts to more easily qualify for funding.

K-16 Council

A working group of staff members from the TEA, SBEC, and THECB began meeting regularly in 1998-99 to collaboratively address K-16 issues. The name of the group was changed officially in 2000 to the K-16 Council, and the membership of the group has expanded to include representatives from all public university systems, colleges of education, private universities, and staff members from legislative offices. The Council continues to work jointly on issues such as aligning high school graduation requirements with college and university admissions requirements, teacher preparation and certification, the K-12 teacher shortage, and improving the success of all students, K-16.

Preparing Tomorrow's Teachers to Use Technology

Preparing Tomorrow's Teacher to Use Technology (PT3), funded by the U.S. Department of Education, is impacting a number of teacher preparation programs in the state including programs offered by: Angelo State University, Houston Independent School District, Our Lady of the Lake University, Southwest Texas State University, Texas A&M University, Texas A&M University-Texarkana, Texas Association of Developing Colleges, Texas Tech University, Texas Women's University, University of Houston, University of Houston-Clear Lake, University of North Texas, University of Texas at Austin, and University of Texas-Brownsville.

An important collaborative initiative, also funded by the PT3 program, is the Technology Leadership Academy housed at the University of Texas at Austin. The Academy is building a collaborative statewide network community of teacher preparation programs focused on systemic change and the infusion of technology into the preparation of teachers. The Academy represents a unique partnership between the University, the Texas Center for Educational Technology (TCET) at the University of North Texas, the TEA, SBEC and THECB.

The Academy is focused on building capacity within the higher education community to support teacher preparation. It is composed of representatives from teacher preparation institutions and state educational agencies. Representative activities include developing Web-based professional development resources for teacher educators and other college faculty; conducting strategic planning institutes for teams of administrators and faculty from member institutions; developing a database of experts within member institutions willing to serve as consultants or online mentors; conducting conferences or work sessions with deans and other educational leaders; conducting regional workshops and seminars; and organizing faculty exchange opportunities to effectively reach the faculty of tomorrow's teachers.

Glossary of Terms

Access to Technology

Access Minimum Standards (per the Texas Education Agency's *Long-Range Plan for Technology, 1996-2010)*:

1:1 multimedia Internet-accessible workstation per educator
3:1 multimedia Internet-accessible workstation per student by 2002
1:1 multimedia Internet-accessible workstation per student by 2010

Administrative Processes

Includes classroom management, student record keeping, etc.

CEDs: Centers For Educator Development

Centers for Educator Development are statewide curriculum centers that provide resources for the implementation of the Texas Essential Knowledge and Skills (TEKS) in the foundation and enrichment curriculum areas. Centers were established to provide a coordinated system of teacher education and professional development for the state of Texas.

CEO Forum's Interactive Teacher Preparation STaR Chart

The CEO Forum on Education and Technology created the *Interactive Teacher Preparation School Technology and Readiness (STaR) Chart* as a self-assessment tool designed to enable SCDE to assess their level of readiness in preparing teachers to use technology. *The STaR Chart* identifies and defines four evaluative profiles ranging from the "Early Tech" program with little or no technology use to the "Target Tech" program that provides a model for the integration and innovative use of educational technology. *The STaR Chart* serves as a benchmark against which every institution can assess and track its own progress.

Distance Learning

The use of technologies such as video, audio, and/or computer so students can participate in the learning process while separated by time and/or distance from the instructor. Distance learning systems are usually interactive and are becoming a valuable tool in the delivery of training and education to widely dispersed students in remote locations or in instances where the instructor cannot travel to the student site or be with the student at the time of instruction.

Educator

Includes all teachers, librarians, counselors and administrators.

E-RATE - Education Rate

The E-Rate program is a federal program of the Universal Service Fund which assists K-12 schools in the purchase of telephone and other telecommunications services, Internet access, and internal networks and wiring by providing discounts of 20% to 90%.

ESC - Education Service Center

Twenty regional education service centers (ESCs) have been established in Texas to provide school districts with services that enhance efficiency, effectiveness and the performance of students, teachers, administrators and school personnel. In the area of educational technology, the ESCs provide planning, consultation, professional development and technical assistance in response to district needs and in support of the State Board of Education's Long-Range Plan for Technology. The Texas Education Agency's Educational Technology Division gives financial support to the ESCs to assist them in these endeavors. Through the Technology Preview Centers and Training Programs established by each of the 20 ESCs, program outcomes include collaborative and partnership development, regional network development and operation, education resources preview center, training and professional development services, Texas Library Connection support, planning and grant development and distance learning opportunities.

ETAC - Educational Technology Advisory Committee

The Educational Technology Advisory Committee (ETAC) is authorized by the Texas Education Code, 7.055.11. The function of ETAC is to work in an advisory capacity to increase the equity, efficiency, and effectiveness of student learning, instructional management, staff development, and administration. ETAC shall provide recommendations to the Texas Education Agency regarding the leadership role of the Agency in providing schools the technology tools, products and information they need to make decisions, to educate, to plan and to learn. The current efforts of the committee focus on the development, implementation, and evaluation of technology guidelines to provide districts with tools for self-assessment to aid in the effective integration of technology across the curriculum.

ExCET: Examination for the Certification of Educators in Texas

Texas law requires every person seeking educator certification to perform satisfactorily on comprehensive examinations. The purpose of these examinations is to ensure that each educator has the necessary content and professional knowledge to perform satisfactorily in Texas public schools. The ExCET program was developed for this purpose. Individuals who desire to be certified in Texas may take the ExCET if they are completing the program requirements of an approved Texas educator preparation program, are fully certified by a state other than Texas or a country other than the United States, and are seeking a Texas standard certificate and have applied for and received a review of their credentials by the State Board for Educator Certification.

FAQs: Frequently Asked Questions

ILL: Interlibrary Loan

Internet Access

The ability of one or more users to utilize an information system for the purpose of initiating the transfer of information, thus enabling them to have access to the collection of interconnected virtual "sites."

Library Standards

In the spring of 1995, the 74th Texas State Legislature, through Senate Bill 1, directed the Texas State Library and Archives Commission, in consultation with the State Board of Education, to adopt standards for school libraries. Those standards are to be used in developing, implementing, or expanding school library programs. Districts and campuses use these standards as guidelines to measure the effectiveness of existing library programs and in the creation of new library programs.

LRPT - Long-Range Plan for Technology

In 1985, in accordance with state legislation, the State Board of Education developed and adopted a long-range plan for the use of technology in education. Texas was one of the first states in the nation to adopt such a visionary plan. The most current long-range plan charts the course for providing all Texas students with access to quality educational opportunities through the use of technology for the years 1996-2010. As outlined in the LRPT, TEA provides leadership and support in the use of technology through a wide variety of technology initiatives. These technology initiatives collectively comprise the Public Access Initiative.

National Council for Accreditation of Teacher Education

NCATE is the profession's mechanism to help establish high quality teacher preparation. Through the process of professional accreditation of schools, colleges and departments of education, NCATE works to make a difference in the quality of teaching and teacher preparation today, tomorrow, and for the next century. NCATE is a coalition of 33 specialty professional associations of teachers, teacher educators, content specialists, and local and state policy makers. All are committed to quality teaching, and together, the coalition represents over 3 million individuals.

PAI: Public Access Initiative

The Public Access Initiative is the Texas Education Agency's strategic plan for the implementation of the *Long-Range Plan for Technology, 1996-2010*. The PAI includes numerous programs and projects, planned and underway, that support each of the Agency's three strategic directions: information access to educational content, business applications, and infrastructure. The PAI calls for the use of the Internet, the Texas Telecommunications Education Network (TETN), the Texas School Telecommunications Access Resource (T-STAR) and regional networks being developed by the education service centers. These four components form the building blocks of an integrated telecommunications service network designed to support the interactive exchange of data and information throughout the Texas K-12 public school community. The PAI services network enables public education stakeholders to readily access and use public education information for analysis and decision-making. The initiative is defined by constantly evolving content and services that students, teachers, parents, superintendents, legislators, and business leaders need in order to make decisions, to educate, to plan, and to learn.

PDAS: Professional Development and Appraisal System

Beginning with the 1997-1998 school year, all school districts have two choices in selecting a method to appraise teachers: a teacher-appraisal system recommended by the Texas commissioner of education or a local teacher-appraisal system. The commissioner's recommended teacher-appraisal system, the Professional Development and Appraisal System (PDAS), was developed in accordance with Texas Education Code (TEC), §21.351.The superintendent of each school district, with the approval of the school district board of trustees, may select the PDAS. Each school district or campus wanting to select or develop an alternative teacher-appraisal system must follow TEC, §21.352.

PEIMS: Public Education Information Management System

The Public Education Information Management System (PEIMS) is a collection of data from and about the public education system in Texas. The submission of data is required of all school districts. The data standards provide instructions regarding the submission of PEIMS data from school districts to the Texas Education Agency.

Performance Review (grant-related)

A post-implementation evaluation or audit that reviews programmatic, financial, technical, and sustainability aspects of each grantee, as well as an entire grant program.

Pre-service Educator

Individual participating in an educator preparation program, prior to certification.

Quality Assurance (grant-related)

The planned and systematic activities necessary to provide adequate confidence that a grantee will fulfill requirements for a quality implementation (i.e., projects are on time, within budget, technically stable, program objectives are attained, and benefits are sustainable for the long term).

Quality Control (grant-related)

The role of providing an independent perspective about the progress of an information systems grant project. The Quality Controller should be dedicated to a monitoring role, maintaining independence from the actual management of the project.

Quality Management

Encompasses Quality Assurance, Quality Control and Performance Review.

SCDE: Schools, Colleges or Departments of Education

This term is frequently used as a generic term to describe the education unit within an institution of higher learning; it identifies the administrative unit responsible for educator preparation.

SBOE: State Board of Education

The Commissioner of Education and the 15 elected members of the State Board of Education oversee the public education system of Texas in accordance with the Texas Education Code. The Board is responsible for the Long-Range Plan for Public Education. The Long-Range Plan envisions a public education system, which promotes student achievement through a reliance on local flexibility, planning, and accountability. The plan states that parents and communities play a crucial role in student learning, educators develop the knowledge and expertise to implement programs that ensure all students can learn, districts and campuses are held accountable for student achievement, and state policies and plans support local decision making.

TAAS: Texas Assessment of Academic Skills

The Division of Student Assessment manages and oversees the development, administration, scoring, and analysis of the statewide student assessment program. The statewide assessment program currently includes the TAAS test and end-of-course examinations. TAAS measures the statewide curriculum in reading and mathematics at Grades 3 through 8 and the exit level; in writing in Grades 4, 8, and the exit level; and in science and social studies at Grade 8. Spanish-version TAAS tests are administered at Grades 3 through 6. Satisfactory performance on the TAAS exit level tests is a prerequisite to a high school diploma.

TCET: Texas Center for Educational Technology

The Texas Center for Educational Technology (TCET) was created by the Texas legislature in 1990 to serve as a K-12 technology and educational research and development clearinghouse that disseminates research-based information to districts, schools, and classrooms. TCET's funding is provided through contracts with the TEA, contributions from TCET members, and through federal and state grants. The Center focuses on research, development, evaluation and grant support services.

Technology Allotment

All school districts in Texas continue to receive a Technology Allotment of $30 per student based upon average daily attendance (ADA) for the purchase of technology and professional development in support of the goals of the *Long-Range Plan for Technology, 1996-2010*. Technology Allotment funds became available to schools beginning in September 1992.

Technology Applications

"Technology Applications" is a comprehensive K-12 curriculum specifically focusing on teaching and learning technology skills and the use of computers and other related electronic tools. The curriculum is specified in the Texas Education Code, §28.002 as a required enrichment curriculum area. The Technology Applications curriculum focuses on creating, accessing, manipulating, utilizing, communicating, and publishing information during the learning process. It is built on the premise that students acquire Technology Applications knowledge and skills in a continuum beginning at the elementary level and continuing through Grade 12. All high school graduates are required to have one Technology Applications graduation credit under all graduation plans.

Technology Applications Texas Essential Knowledge And Skills

Technology Applications Texas Essential Knowledge and Skills (TEKS) were adopted by the SBOE in 1997 to provide rigorous standards as well as flexibility for schools. As an enrichment curriculum area, the Technology Applications TEKS serve as guidelines in providing instruction. The goal of the Technology Applications TEKS is for students to gain knowledge and skills and to apply them in all curriculum areas, at all grade levels. Technology Applications TEKS are divided into grade clusters for Grades K-2, 3-5, and 6-8 and into eight high school courses.

TEKS: Texas Essential Knowledge and Skills

The SBOE-adopted curriculum for all Texas schools.

TETN: Texas Education Telecommunications Network

The Texas Education Telecommunications Network (TETN) is a statewide telecommunications network among the 20 ESCs and the Texas Education Agency, which provides compressed two-way video/audio and data transmission using dedicated T1 lines with the capabilities to connect to schools and other public institutions. As part of the ATM Project of the Commissioner's Public Access Initiative, TETN has been upgraded to facilitate integration with the ATM technology planned for in the General Service Commission's statewide telecommunications system, TEX-AN 2000, and the regional networks being developed by the ESCs.

TEX-AN 2000: Texas Agency Network 2000

TEX-AN 2000 is the planned upgrade of the existing Texas Agency Network (TEX-AN) III. TEX-AN was installed to meet the telecommunications needs of state government and has since been expanded to include political subdivisions such as cities, counties and school districts. The network has reached the limits of the economies of scale available through the existing network design and the T1 and DS3 technologies. Bandwidth requirements continue to grow, especially for data and video applications. The growth in network traffic and requirements indicate an immediate need to begin the design and implementation of TEX-AN 2000.

TEXAS STaR CHART

The Texas STaR Chart is a self-assessment tool created by ETAC for Texas school districts to aid in the effective integration of technology across the curriculum. *The Texas STaR Chart*, which is based on the CEO Forum's *STaR Chart*, includes technology-related questions on teaching and learning, professional development, administration and infrastructure. A rating in each area and composite score are calculated to assess district proficiency in the area of technology. *The STaR Chart* identifies and defines four evaluative profiles ranging from the "Early Tech" program with little or no technology use to the "Target Tech" program that provides a model for the integration and innovative use of educational technology. *The STaR Chart* serves as a benchmark against which every institution can assess and track its own progress.

TIE: Technology Integration in Education

The TIE initiative is the title of the state initiative administered under Public Law 103-382, Elementary and Secondary Education Act (ESEA), Title III, Part A, Subpart 2—Technology Literacy Challenge Fund (TLCF). The primary object of this funding opportunity is to improve student achievement by fully integrating technology into teaching and learning and to ensure that all students are technologically literate by 2010.

TIFTech Training

The purpose of the TIFTech training is to provide a TIF grant recipient with the opportunity to learn how to maintain and use a telecommunications infrastructure. Training consists of topics such as: use of the Internet, integration of the Internet into the curriculum and classroom, strategies for maintaining and updating equipment, development of plans and guidelines for the use of the Internet, and finding resources and mentors. Following training, the team becomes a resource for the school district, library, not-for-profit health care facilities and other community organizations in order to facilitate collaboration and increase community participation.

TLC: Texas Library Connection

The TLC, a statewide technology initiative administered by the Texas Education Agency, provides current, relevant information resources to Texas school communities enrolled in the project. Students and educators identify, access, and retrieve more than 44 million items such as books, videos, and software held in participating school libraries through a database created for Texas and maintained by Auto-Graphics, Inc. Two other databases are also available: The Gale Group, which provides more than 1,300 full-text magazines, journals, and newspapers and the Encyclopedia Britannica, which is updated daily and linked to more than 130,000 websites selected by Britannica's editors.

TLCF: Technology Literacy Challenge Fund

TLCF is the federal program designed to help advance the national goals for educational technology as specified in the nation's, long-range plan for technology, Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. This program is administered under Public Law 103-382, Elementary and Secondary Education Act (ESEA), Title III, Part A, Subpart 2.

TPG: Telecommunications Planning Group

The TPG includes the Comptroller, the Department of Information Resources and the General Services Commission. Established by Senate Bill 365, TPG's purpose is to collect and manage telecommunications network configurations and information about existing and planned telecommunications networks throughout state government; establish plans and policies for a system of telecommunications services to be managed and operated by the General Services Commission; and develop a statewide telecommunications operating plan for all state agencies.

T-STAR: Texas School Telecommunications Access Resource

T-STAR is a statewide telecommunications initiative that provides one-way video, two-way audio satellite communications to school districts, ESCs and the Texas Education Agency. The K-12 public education community can access for-credit distance learning courses; curriculum enhancement programming and electronic field trips; and professional development teleconferences from a wide variety of service providers. Audiences can also access programming from the Texas Education Agency, which is broadcast over the T-STAR Network.

T-STAR Network Studio

The T-STAR Network studio is a fully operational television production facility that produces and broadcasts live and pre-recorded programming, uplinked via satellite over the T-STAR Network. T-STAR delivers staff development, training, Agency news updates and TEA press conferences to audiences statewide. The T-STAR satellite communications system allows audiences to interact live with presenters through a toll-free phone line. T-STAR production services utilize digital and analog equipment for producing programming and offer six different video formats for maintaining compatibility with other programming providers. A separate, dial-up videoconferencing studio can be used for stand-alone, two-way (video/audio) videoconference activities or can be integrated with T-STAR Network broadcast programming.

Selected Bibliography

Selected Bibliography

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Medrinos, R.B. *Using Educational Technology With At-Risk Students: A Guide For Library Media Specialists And Teachers.* Greenwood Professional Guides in School Librarianship. Westport, Conn.: Greenwood Press. 1997. This guide offers library media specialists, teacher solutions and practical applications of educational technology within subject disciplines to help improve the achievement of at-risk students. Included are lesson plans, successful case studies, and project ideas for replication in language arts, science, and social studies. It also contains extensive lists of Internet addresses and other technology resources and bibliography of further reading.

Milken Family Foundation. *West Virginia Study.* 1999. This study finds direct links between use of learning technology and higher academic achievement in West Virginia. Students raised their standardized test scores in math, reading and language arts with the state's Basic Skills/Computer Education Program.

Moursund, D.G., T. Bielefeldt, R. Ricketts, and S. Underwood. *Effective Practice: Computer Technology In Education.* Eugene, Ore.: ISTE. 1995. Comprehensive summary and analysis of the research literature and other information on effective uses of computer technology in K-12 education.

President's Committee of Advisors on Science and Technology; Panel on Education Technology. *Report to the President on the Use of Technology to Strengthen K-12 Education in the United States.* March 1997 <http://www.whitehouse.gov>. The panel makes a case for increased federal spending on research into education and educational technology. They also recommend that overall spending on hardware, software and especially professional development be increased, with a focus on the use of computers in general education rather than simply on the development of computer literacy in isolation from applications. They state the need for increased efforts on behalf of those students who are less likely to have access to computers at home.

Rockman, S. et al. *Facilitating Change.* National Foundation for the Improvement of Education's (NFIE) Learning Tomorrow project and school reform. Submitted to the NFIE. San Francisco, Calif.: 1995. This report documents the accomplishments of Learning Tomorrow program sites in the southeast, and identifies the process of facilitating and encouraging change with technology that succeeds in generating school reform. It describes the Learning Tomorrow program; highlights achievements from particular sites, and provides in-depth case studies of four sites. The report discusses school and classroom changes that evolved, the improved attitudes and intellectual growth that students attained, and the professional and personal development of teachers involved in the project.

Scardamalia, M. and C. Bereiter. "Engaging Students in Knowledge Society." *Educational Leadership 54 (3)*: 6-10. 1996. Includes descriptions of projects using Computer Supported International Learning Environment (CSILE) databases, together with a comparison of authors' Knowledge Society approach with other telecommunications-based partnerships.

Schacter, John. "The Impact of Education Technology on Student Achievement: What the Most Current Research Has to Say". Milken Exchange on Education Technology 1999 <http://www.mff.org>. This briefing outlines what current research has discovered regarding the impact of educational technology on learning, and identifies resources for further study. While most of this research is in its infancy, we are beginning to see solid work emerge. This document looks at some of the large-scale state and national studies, as well as some innovative smaller studies that provide visions for new and effective uses of technology in learning and instruction.

Schrum, Lynne. "Technology in the Classroom: Asking the Right Questions." International Society for Technology in Education. 1999. <http://www.enc.org/topics/edtech>. Describes ways in which technology can change the nature of teaching and learning in positive ways. The author points out the need for professional development in educational technology for practitioners, and the intense amount of time that educators must be afforded to develop their expertise with technology.

Software and Information Industry Association. *Research Report on the Effectiveness of Technology in Schools: Executive Summary,* 6th Edition. 1999. <http://www.siia.net> Examines the effects of technology on student achievement, student self-concept and attitudes about learning and teacher-student interaction in the learning environment. Reports on the effects of software design characteristics on student achievement, as well as recent technologies, instructional decisions, special populations and learning environment characteristics.

State of Victoria, Australia; Department of Education, Employment and Training. *Rethinking Learning and Teaching: The Navigator School Experience. (1998.)* <http://www.sofweb.vic.edu.au/navschls/report.htm>. Investigates the effects of providing technology access for all classrooms in a network of exemplary ("navigator") schools. Documents the "significant cultural change" at all of the navigator schools. Presents ten key findings related to the navigator schools.

Technology Counts '99. Special issue of Education Week and the Education Market Research. (1999.) <http://www.edweek.org/sreports/tc99/index.htm> Education Week's third annual report on educational technology. Comprehensive survey on teachers' use of and attitudes about digital content. Responses were received from 1047 teachers who all had access to a computer. Issues such as the quality of digital content, teacher preparedness, and integrating the technology into the curriculum are covered extensively. Survey finds that professional development is important and assists teachers in overcoming the most important obstacle in the use of digital content – the lack of training. The report also includes state by state data.

The Power of Digital Learning: Integrating Digital Content. (2000.) From the CEO Forum Series of School Technology and Readiness Reports <http://www.ceoforum.org/> Describes the "four pillars" of educational technology as 1) hardware; 2) connectivity; 3) software; and 4) professional development. The report also provides an overall vision for digital learning, a description of the potential for digital learning, a call to make adjustments at the school district level in order to implement digital learning, and recommended methods to ensure greater success in integrating digital content effectively.

United States. Congress. Office of Technology Assessment. Teachers & Technology: Making the Connection (OTA-HER-616). Washington D.C.: U.S. Government Printing Office. 1995. A landmark study of technology in the U.S schools from the point of view of educators. Provides good insight to the current status and possible futures of technology in K-12 education.

--- . Department of Commerce. National Telecommunications and Information Administration. Falling Through the Net: Defining the Digital Divide. Washington, D.C. 2000. < www.ed.gov/technology/digdiv.html> This report surveys household's access to telephones, computers, and the Internet, updating the surveys in two previous reports. It also provides significant new information on individual Internet usage, including how people connect to the Internet and spend their time online. Finally, it reports the challenges ahead in solving the digital divide and highlights the significance of several key policies in promoting access.

--- . Department of Education. An Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms. 1998. <http://www.ed.gov> A resource manual to help educators and administrators tailor technology and evaluations of technology to the needs of their schools and districts. Using a hands-on approach, the guide describes the process step by step; it provides tips, worksheets and other tools for evaluating educational technology.

--- . --- . Getting America's Students Ready For The 21st Century: Meeting The Technology Literacy Challenge. Washington, D.C. June 29, 1996. <http://www.ed.gov>.

--- . --- . National Center for Education Statistics. Internet Access in Public Schools and Classrooms: 1994-1998. (NCES 99-017). Washington, D.C.: Government Printing Office. 1999. <http://www.nces.ed.gov> A statistical report of access to the Internet in schools and classrooms through the United States.

--- . --- . --- . Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology. 2000. <http://www.nces.ed.gov> A report on the findings of a short survey of public education teachers focused on the availability of technology, the way in which these technologies are used, training and preparation for the use of technology and barriers to use.

--- . --- . Office of Educational Technology. E-Rate and the Digital Divide: A Preliminary Analysis from the Integrated Studies of Educational Technology. 2000. <http://www.ed.gov> This report is a formative evaluation of the first two years of the operation of the E-Rate program finds that three-out-of-four public schools are participating. E-Rate is helping build capacity and provide access to online learning resources. Nine key findings are detailed in this report, including the results that the schools with the greatest need are receiving the majority of the funding.

--- . --- . The Secretary's Conference on Educational Technology: Evaluating the Effectiveness of Technology. 2000. Information and materials from this national conference, including conference white papers, spotlight schools, featured speakers and conference research materials as well as links to a wide variety of other valuable research reports, < http://www.ed.gov/Technology>

Wenglinsky, H. *Does it Compute? The Relationship Between Educational Technology and Student Achievement in Mathematics.* 1998. Princeton, N.J.: ETS. A study of the effects of computers in mathematics instruction on the achievement of students from various backgrounds. The study analyzed data from the 1996 National Assessment of Educational Progress.

Appendix

Appendix

- TEA Rider 74
- Proposed Revisions to TEA Rider 74
- Mission and Charter Statement
- Membership Roster
- Agency Website Addresses
- SBEC Technology Applications Standards

Texas Education Agency Rider

Current Rider Number
74.

Page Number in General Appropriations Act, 2000-01 Biennium (2000-01 GAA)
III -22

Rider Language

Education Technology Coordinating Council.

The Texas Education Agency (TEA), the Department of Information Resources (DIR), the General Services Commission (GSC), the State Board for Educator Certification (SBEC), the Telecommunications Infrastructure Fund (TIF) Board, the State Library and Archives Commission (SLAC), the Higher Education Coordinating Board (HECB), and Colleges of Education shall direct a representative of their agency or institution to participate in an Education Technology Coordinating Council designed to ensure the cooperation and coordination of the state's efforts to implement educational technology initiatives. The Council is also charged with the development of a statewide master plan for educational technology. The Council shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians. Participating agencies shall share resources as necessary to provide adequate staff for the Council.

Proposed Revisions to Texas Education Agency Rider

Current Rider Number
74.

Page Number in General Appropriations Act, 2000-01 Biennium (2000-01 GAA)
III -22

Proposed Rider Language

Education Technology Coordinating Council.

The Texas Education Agency (TEA), Department of Information Resources (DIR), General Services Commission (GSC), State Board for Educator Certification (SBEC), Telecommunications Infrastructure Fund (TIF) Board, State Library and Archives Commission (SLAC), Higher Education Coordinating Council (THECB), Colleges of Education and the Colleges of Library Science shall ensure that their Agency Strategic Plans adhere to and support the *State of Texas Master Plan for Educational Technology* prepared by the Education Technology Coordinating Council (the Council) under the provisions of Rider 74, House Bill 1, 77th Legislature.

The TEA, DIR, GSC, SBEC, TIF, SLAC, THECB, Colleges of Education, and the Colleges of Library Science shall direct a representative of their agency or institution to participate in the Council. The Council shall ensure the coordination of the state's efforts to implement educational technology initiatives.

The Council is charged with the continuing development and maintenance of the *State of Texas Master Plan for Educational Technology* and submitting an updated Master Plan to the Legislature in December of every even-numbered year. The Plan shall articulate the vision and maintain the unified policy direction to guide the creation and implementation of educational technology initiatives in Texas.

The ETCC shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians.

Education Technology Coordinating Council
Mission and Charter Statement

Mission

The Education Technology Coordinating Council (Council) is established to represent the interests of both the State of Texas and of state agencies and institutions of higher education (agencies) to ensure the cooperation and coordination of the state's efforts to implement educational technology initiatives. The Council shall develop a statewide master plan for educational technology. The Council shall give particular attention to the coordination of pre-service and in-service training for teachers and librarians. Participating agencies shall share resources as necessary to provide adequate staff for the Council. Agencies participating in the Council include:

- The Texas Education Agency (TEA)
- The Department of Information Resources (DIR)
- The General Services Commission (GSC)
- The State Board for Educator Certification (SBEC)
- The Telecommunications Infrastructure Fund (TIF) Board
- The State Library and Archives Commission (TSLAC)
- The Higher Education Coordinating Board (THECB)
- Colleges of Education

The Council recognizes that it has a higher duty to represent the interests of the State of Texas over the individual interests of the state agencies. If there are conflicts between the needs and interests of the State of Texas and the interests of any individual agencies, the Council will make recommendations that consider the greater interests of the State of Texas.

Guiding Documents

The guiding documents governing the work of the ETCC are:

- Rider 74 to the Texas Education Agency appropriation;
- Texas Education Agency's *Long Range Plan for Technology, 1996-2010;*
- Telecommunications Infrastructure Fund Board's Master Plan;
- Higher Education Coordinating Board's Master Plan for Distance Learning;
- State of Texas Strategic Plan; and
- The Department of Information Resources' 1997 State Strategic Plan for Information Resource Management.

Education Technology Coordinating Council
Mission and Charter Statement

Council Responsibilities and Deliverables

The Education Technology Coordinating Council shall:

- Establish and maintain bylaws regarding membership, responsibilities and governance of the Council.
- Charter Working Committees.
- Consider and vote on recommendations received from the standing and ad hoc committees.
- Develop a statewide master plan for educational technology.
- Coordinate pre-service and in-service training for teachers and librarians.

Council Membership

The Council shall have Voting, Non-Voting and Ex-Officio Members.

Memberships belong to agencies, not to individuals.

The executive officer of each Voting Member shall designate, the primary representative to the Council.

- Voting Members are:

    1. State agencies that have been identified by the Texas State Legislature in Rider 74 to the Texas Education Agency appropriation; and,
    2. A College of Education representative nominated by peers to serve on the Council Steering Committee and represent the remaining Colleges on the Council. This individual would be responsible for communicating back to College of Education peers on an ongoing basis.

Voting members are designated in Attachment 1 to this Charter; this attachment will be updated as appropriate upon a simple majority vote of the voting members.

- Non-voting members are state agencies and other organizations that have significant interest in educational technology initiatives.

  Non-voting members are designated in Attachment 2 to this Charter; this attachment will be updated as appropriate upon a simple majority vote of the voting members.

Education Technology Coordinating Council
Mission and Charter Statement

Voting Member Attendance

Regular attendance at called meetings is required to maintain a voting membership.

The attendance requirement is satisfied when a Voting Member attends electronically: e.g. via video teleconferencing.

The Chair will contact the Voting Member after two or more consecutive absences.

Council Officers and Responsibilities

The Council will have three officers: a Chair, Vice-Chair and Secretary.

The duties of the officers are:

- ◇ Chair: call, set agendas and preside at meetings of the Council, including executive sessions of the voting members; represent the Council as required.
- ◇ Vice-chair: act in the Chair's absence, performing any and all duties of the Chair as required.
- ◇ Secretary: certifies the minutes prior to distribution to the membership.

Council Officer Elections and Terms

Officers will be elected from among the Voting Members.

A quorum of Voting Members must be present to elect officers.

The election of officers will be held at the kickoff meeting on September 27, 1999.

Officers will be elected by simple majority vote of the voting members.

Each term of office will be for the duration of the Council's charge.

Council Meetings

Meetings will be held quarterly or at the call of the Chair.

A quorum of the voting members is required to conduct a meeting.

Meetings will be open and meeting times, places and agendas will be posted to the DIRweb site at www.dir.state.tx.us.

Meetings will be documented.

Minutes will be kept and posted for public information.

The Chair may call the voting members into an Executive Session of the Council at the discretion of the Chair.

Voting

Each voting member has only one vote.

A simple majority vote of the voting members is required to adopt recommendations or take action on matters before the Council.

Council Committees

- The Council will act as a Committee of the Whole when:

  1. Participating in planning discussions; and,
  2. Considering reports and recommendations made by the Working Committees.

- The Council will charter and appoint the Chairs of Working Committees.

- The Working Committees of the Council are:

  1. Mission Development
  2. Goals Development (8 committees; one for each goal)
  3. Research
  4. Report Development

- The charters will include the primary responsibilities of each of the committees. The committees may recommend changes or additions to the charters for consideration by the Council.

- Working Committees must consider both chartered duties and referred actions in the context of what is best for the state. Recommendations must reflect the committee's best judgment as to the best course of action for the state. The impacts to individual agencies should be noted for Council consideration.

- The Council will refer matters to the various committees at its discretion. Each referral will be specific and include the requested time for completion of the referral, as well as the resources that can be made available to the committee.

- Committees will provide decision and recommendation documents, in the form determined by the Council, to the Council for their consideration.

Committee Membership

A representative of a Voting Member will chair each Working Committee.

The Council will appoint the initial members of all committees. The committees may add other members at their discretion.

Voting members will serve as members of Working Committees appointed by the Council.

Non-voting members may serve as members on Working Committees appointed by the Council.

Committees may create subcommittees and determine their membership at their discretion.

Committee Meetings

Meetings will be held at the call of the Chair of the Committee.

Meetings will be open and meeting times, places and agendas will be posted to the DIR website at www.dir.state.tx.us.

Minutes will be kept and posted for public information.

A quorum of committee members must be present to consider adopting recommendations for consideration by the Council.

A simple majority vote of the committee members present is required to adopt recommendations for consideration by the Council.

Attachments

1. Voting members
2. Non-voting members

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Name	Title	Telephone #	Email Address	Mailing Address
AGENCIES					
Department of Information Resources	Carolyn Purcell*	Executive Director	512.475.4720	Carolyn.purcell@dir.state.tx.us	P.O. Box 13564 Austin, Texas 78711-2482
General Services Commission	Stephen Parker*		512.463.3471	Stephen.parker@gsc.state.tx.us CC to: Cinda.carter@gsc.state.tx.us	P.O. Box 13047 Austin, Texas 78711-3047
Higher Education Coordinating Board	Dr. William H. Sanford	Former Assistant Commissioner	512.483.6200	Sanfordbl@thecb.state.tx.us	Box 12788 Austin, Texas 78711-2788
Higher Education Coordinating Board	Dr. Gloria A. White*	Acting Assistant Commissioner	512.427.6224	Gwhitega@thecb.state.tx.us	Box 12788 Austin, Texas 78711-2788
State Board for Educator Certification	Pam Tackett*	Executive Director	512.469.3000	ptackett@sbec.tetn.net	1001 Trinity Austin, Texas 78701-2603
Telecommunications Infrastructure Fund	Sam Tessen*	Executive Director	512.344.4303	stessen@tifb.state.tx.us	P.O. Box 12876 Austin, Texas 78711
Telecommunications Infrastructure Fund	Whitney Sklar	Research Specialist	512.344.4300	wsklar@tifb.state.tx.us	P.O. Box 12876 Austin, Texas 78711
Texas Education Agency	Ann Smisko*	Associate Commissioner for Curriculum, Assessment and Technology	512.463.9087	Asmisko@tmail.tea.state.tx.us	1701 Congress Avenue Austin, Texas 78701-1494
Texas Education Agency	Nancy Vaughan	Coord. Info Systems	512.463.9790	Nvaughan@tmail.tea.state.tx.us	1701 Congress Avenue Austin, Texas 78701-1494
	Anita Givens	Sr. Dir. Ed Tech	512-463-9400	agivens@tea.tetn.net	
	Brian Rawson	Sr. Dir. Info Planning	512-463-9758	brawson@tmail.tea.state.tx.us	
	Kate Loughrey	Asst. Dir. Ed Tech	512-463-9401	kloughre@tea.tetn.net	

*Denotes voting member

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Name	Title	Telephone #	Email Address	Mailing Address
HIGHER EDUCATION					
Texas State Library & Archives Commission	Deborah Littrell*		512.463.5456	deborah.littrell@tsl.state.tx.us	P.O. Box 12927 Austin, Texas 78711-2927
Angelo State University	John Miazga		915.942.2052	John.miazga@angelo.edu	PO Box 11007 ASU Station San Angelo, TX 76909
Lamar University at Beaumont	Dr. Carl Westerfield	Dean of Education	409.880.8661	Westerfirc@hal.lamar.edu	4400 Martin Luther King Parkway Beaumont, TX 77710
Midwestern State University	Mary Ann Coe	Division of Education	940.397.4137	Maryann.coe@nexus.mwsu.edu	3410 Taft Boulevard Wichita Falls, TX 76308-2095
Prairie View A&M University	Dr. M. Paul Mehta	Dean, College of Education	409.857.3820	Pmehta@pvamu.edu	FM 1098, P.O. Box 188 Prairie View, TX 77446
Sam Houston State University	Dr. Kenneth Craycraft	Dean, College of Education & Applied Science	409.294.1100	edu_kxc@shsu.edu	PO Box 2029 Huntsville, TX 77341
Southwest Texas State University	Dr. John Beck*	Dean, School of Education	512.245.2150	JB01@swt.edu	601 University Drive San Marcos, TX 78666
Stephen F. Austin State University	Dr. Thomas Franks	Dean, School of Education	409.468.2901	tfranks@sfasu.edu	PO Box 13023 Nacogdoches, TX 75962
Sul Ross State University	Joyce Mussey	Director, Teacher Education	915.837.8164	Jmussey@sulross.edu	P.O. Box C-108 Alpine, TX 79832-0001
Tarleton State University	Dr. Joe Gillespie	Dean, College of Education & Fine Arts	254. 968.9089	jgilles@tarleton.edu	PO Box T - 0001 Stephenville, TX 76402-0001
Texas A&M University	Dr. Jane Conoley	Dean, College of Education	409.845.5313	conoley@acs.tamu.edu	College of Education Office of the Dean College Station, TX 77843

*Denotes voting member

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Name	Title	Telephone #	Email Address	Mailing Address
Texas A&M University-Commerce	Dr. Jerry B. Hutton	Dean, College of Education	903.886.5180	Jerry_Hutton@tamu-commerce.edu	College of Education Office of the Dean 2600 S. Neal St. Commerce, TX 75429
Texas A&M University-Commerce	Dr. Sue Espinoza	Department of Secondary and Higher Education, College of Education	903.886.5500	Sue_Espinoza@tamu-commerce.edu	Secondary & Higher Education 2600 S. Neal St. Commerce, TX 75429
Texas A&M University at Corpus Christi	Dr. Robert Cox	Dean, College of Education	361.994.2661	Rcox@falcon.tamucc.edu	6300 Ocean Drive Corpus Christi, TX 78412
Texas A&M International University	Dr. Rosa Maria Vida	Dean, College of Education	956.326.2420	rmvida@tamiu.edu	5201 University Boulevard Laredo, TX 78041-1900
Texas A&M University at Kingsville	Dr. Robert Marshall		361.593.2994	Kfrlm00@tamuk.edu	Box 195 Kingsville, TX 78363
Texas A&M University at Texarkana	Dr. Carol Harrell	Division Head, Arts/Science & Education	903.223.3015	carol.harrell@tamut.edu	PO Box 5518 Texarkana, TX 75501-5518
Texas Southern University	Larry Grant & Dr. Donald Dement	Interim Dean, College of Education	713.313.7467	Ddement@sctcorp.com	3100 Cleburne Street Houston, TX 77004
Texas Tech University	Vance Durrington	College of Education	806.742.2394	Vance@ttacs.ttu.edu	PO Box 41071 Lubbock, TX 79409
Texas Woman's University	Dr. Michael J. Wiebe	Dean, College of Education & Human Ecology	940.898.2204	A_wiebe@twu.edu	PO Box 425769, TWU Station Denton, TX 76204
University of Houston at Clear Lake	Dr. Trudy Driskell Dr. Caroline M. Crawford	Asst. Professor, School of Education	281.283.3568 281.283.3587	Driskell@cl.uh.edu Crawford@cl.uh.edu	2700 Bay Area Boulevard Houston, TX 77058-1098
University of Houston - Downtown	Dr. Evelyn R. Brown	Department of Urban Education	713.221.8208	Browne@dt.uh.edu	1 Main Street Houston, TX 77002-1001
University of Houston - Main	Dr. Allen Warner	Dean, College of Education	713.743.5001	Awarner@uh.edu	4800 Calhoun Road Houston, TX 77204

*Denotes voting member

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Name	Title	Telephone #	Email Address	Mailing Address
University of Houston at Victoria	Dr. Cheryl Hines	CHRM, Division of Education	361.788.6247	Hinesc@cobalt.vic.uh.edu	2302 East Red River Victoria, TX 77901
University of North Texas	Ms. Joneel Harris	Registrar	940.565.2748	HarrisJ@unt.edu	PO Box 311400 Denton, TX 76203-1400
University of Texas at Arlington	Dr. Jeanne Gerlach Dr. John Jacobson & Dr. Kathy Canaday	Dean, School of Education Center for Professional Teacher Education	817.272.5476 817.272.3346 817.272.2853	Gerlach@uta.edu Jacobson@uta.edu Canaday@uta.edu	PO Box 19227 Arlington, TX 76019
University of Texas	Dr. Paul Resta*	College of Education	512.471.4014	Resta@mail.utexas.edu CC to: Mjowens@mail.utexas.edu	Main Building Austin, TX 78712
University of Texas at Dallas	Dr. Scherry Johnson	Director, Office of Teacher Education	972.883.2730	Ashoffst@utdallas.edu	PO Box 830688 Richardson, TX 75083-0688
University of Texas at El Paso	Dr. Arturo Pacheco	Dean, College of Education	915.747.5572	apacheco@utep.edu	500 West University Avenue Education Building, Room 414 El Paso, TX 79968-0691
University of Texas - Pan American	Dr. Hilda Medrano	Dean, College of Education	956.381.3627 EXT. 3628	medrano@panam.edu	College of Education Office of the Dean 1201 W. University Drive Edinburg, TX 78539
University of Texas - Permian Basin	Dr. Jose Ruiz-Escalante	Dean, School of Education	915.552.2139	Ruiz_J@utpb.edu	Odessa, TX 79762
University of Texas at San Antonio	Dr. Christopher A. Borman	Director, Division of Education	210.458.4408	Cborman@utsa.edu	6900 North Loop 1604 West San Antonio, TX 78249-1130
University of Texas at Tyler	Dr. Milford Clark (will be represented by Sharon Back)	Dean, School of Education	903.566.7050	Mil_clark@mail.uttyl.edu	3900 University Boulevard Tyler, TX 75799
West Texas A&M University	Dr. Ted Guffy	Dean, College of Education	806.651.2603	tguffy@mail.wtamu.edu	2501 4th Avenue Canyon, TX 79016-0001

*Denotes voting member

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Web Address
AGENCIES	
Department of Information Resources	http://www.dir.state.tx.us
General Services Commission	http://www.gsc.state.tx.us/
Higher Education Coordinating Board	http://www.thecb.state.tx.us/
State Board for Educator Certification	http://www.sbec.state.tx.us/
Texas Education Agency	http://www.tea.state.tx.us/
Texas State Library & Archives Commission	http://www.tsl.state.tx.us/
TIF Board	http://www.tifb.state.tx.us/
HIGHER EDUCATION	
Angelo State University	http://www.angelo.edu/
Lamar University at Beaumont	http://www.lamar.edu/
Midwestern State University	http://www.mwsu.edu/
Prairie View A&M University	http://www.pvamu.edu/
Sam Houston State University	http://www.shsu.edu/
Southwest Texas State University	http://www.swt.edu/
Stephen F. Austin State University	http://www.sfasu.edu/
Sul Ross State University	http://www.sulross.edu/
Tarleton State University	http://www.tarleton.edu/
Texas A&M University	http://www.tamu.edu/
Texas A&M University-Commerce	http://www.tamu-commerce.edu/
Texas A&M University at Corpus Christi	http://www.tamucc.edu/

Education Technology Coordinating Council (ETCC)
MEMBERSHIP ROSTER

Organization	Web Address
HIGHER EDUCATION	
Texas A&M International University	http://www.tamiu.edu/
Texas A&M University at Kingsville	http://www.tamuk.edu/
Texas A&M University at Texarkana	http://www.tamut.edu/
Texas Southern University	http://www.tsu.edu/
Texas Tech University	http://www.ttu.edu/
Texas Woman's University	http://www.twu.edu/
University of Houston at Clear Lake	http://www.cl.uh.edu/
University of Houston - Downtown	http://www.dt.uh.edu/
University of Houston - Main	http://www.uh.edu/
University of Houston at Victoria	http://www.vic.uh.edu/
University of North Texas	http://www.unt.edu/
University of Texas at Arlington	http://www.uta.edu/
University of Texas at Austin	http://www.utexas.edu/
University of Texas at Dallas	http://www.utdallas.edu/
University of Texas at El Paso	http://www.utep.edu/
University of Texas - Pan American	http://www.tr-riscs.panam.edu/
University of Texas - Permian Basin	http://www.utpb.edu/
University of Texas at San Antonio	http://www.utsa.edu/
University of Texas at Tyler	http://www.utt.edu/
West Texas A&M University	http://www.wtamu.edu/

SBEC Technology Applications Standards

Standard I. **All teachers use technology-related terms, concepts, data input strategies, and ethical practices to make informed decisions about current technologies and their applications.**

Teacher Knowledge: What All Teachers Know

Teachers of Students in Grades EC-12

The beginning teacher knows and understands:

1.1k the appropriate use of hardware components, software programs, and their connections;

1.2k data input skills appropriate to the task; and

1.3k laws and issues regarding the use of technology in society.

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12

The beginning teacher is able to:

1.1s demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components;

1.2s compare, contrast, and appropriately use various input, processing, output, and primary/secondary storage devices;

1.3s select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency;

1.4s delineate and make necessary adjustments regarding compatibility issues, including, but not limited to, digital file formats and cross-platform connectivity;

1.5s use technology terminology appropriate to the task;

1.6s perform basic software application functions, including, but not limited to, opening an application program and creating, modifying, printing, and saving documents;

1.7s explain the differences between analog and digital technology systems and give examples of each;

1.8s use appropriate terminology related to the Internet, including, but not limited to, electronic mail (e-mail), uniform resource locators (URLs), electronic bookmarks, local area networks (LANs), wide area networks (WANs), World Wide Web (WWW) pages, and Hypertext Markup Language (HTML);

1.9s compare and contrast LANs, WANs, the Internet, and intranets;

1.10s use a variety of input devices such as mouse/track pad, keyboard, microphone, digital camera, printer, scanner, disk/disc, modem, CD-ROM, and joystick;

Standard I. **All teachers use technology-related terms, concepts, data input strategies, and ethical practices to make informed decisions about current technologies and their applications.**

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12 (continued)

1.11s demonstrate keyboarding proficiency in technique and posture while building speed;

1.12s use digital keyboarding standards for data input such as one space after punctuation, the use of em/en dashes, and smart quotation marks;

1.13s develop strategies for capturing digital files while conserving memory and retaining image quality;

1.14s discuss copyright laws, violations, and issues including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy;

1.15s model ethical acquisition and use of digital information including citing sources using established methods;

1.16s demonstrate proper etiquette and knowledge of acceptable use of electronic information and products while in an individual classroom, lab, or on the Internet or an intranet;

1.17s identify the impact of technology applications on society through research, interviews, and personal observation; and

1.18s demonstrate knowledge of the importance of technology to future careers, lifelong learning, and daily living for individuals of all ages.

SBEC Technology Applications Standards

Standard II. **All teachers identify task requirements, apply search strategies, and use current technology to efficiently acquire, analyze, and evaluate a variety of electronic information.**

Teacher Knowledge: What All Teachers Know

Teachers of Students in Grades EC-12

The beginning teacher knows and understands:

2.1k a variety of strategies for acquiring information from electronic resources;

2.2k how to acquire electronic information in a variety of formats; and

2.3k how to evaluate acquired electronic information.

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12

The beginning teacher is able to:

2.1s use strategies to locate and acquire desired information from collaborative software and on networks, including the Internet and intranets;

2.2s apply appropriate electronic search strategies in the acquisition of information, including keyword and Boolean search strategies;

2.3s identify, create, and use files in various appropriate formats such as text,bitmapped/ vector graphics, image, video, and audio files;

2.4s access, manage, and manipulate information from secondary storage andremote devices;

2.5s use on-line help and other documentation;

2.6s determine and employ methods to evaluate electronic information for accuracy and validity;

2.7s resolve information conflicts and validate information by accessing, researching, and comparing data from multiple sources; and

2.8s identify the source, location, media type, relevancy, and content validity of available information.

SBEC Technology Applications Standards

Standard III. **All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions, and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.**

Teacher Knowledge: What All Teachers Know

Teachers of Students in Grades EC-12

The beginning teacher knows and understands:

3.1k how to use appropriate computer-based productivity tools to create and modify solutions to problems;

3.2k how to use research skills and electronic communication to create new knowledge; and

3.3k how to use technology applications to facilitate evaluation of work, including both process and product.

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12

The beginning teacher is able to:

3.1s plan, create, and edit word processing documents using readable fonts, alignment, page setup, tabs, and ruler settings;

3.2s plan, create, and edit spreadsheet documents using all data types, formulas and functions, and chart information;

3.3s plan, create, and edit databases by defining fields, entering data, and designing layouts appropriate for reporting;

3.4s demonstrate proficiency in the use of multimedia authoring programs by creating linear or nonlinear projects incorporating text, audio, video, and graphics;

3.5s plan, create, and edit a document using desktop publishing techniques including, but not limited to, the creation of multicolumn or multi-section documents with a variety of text-wrapped frame formats;

3.6s differentiate between and demonstrate the appropriate use of a variety of graphic tools found in draw and paint applications;

3.7s integrate two or more productivity tools, including, but not limited to, tables, charts and graphs, graphics from paint or draw programs, and mail merge, into a document;

3.8s use interactive virtual environments, appropriate to grade level, such as virtual reality or simulations;

3.9s use technical writing strategies to create products such as a technical instruction guide;

Standard III. **All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions, and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.**

	Application: What All Teachers Can Do
	Teachers of Students in Grades EC-12 (continued) 3.10s use subject matter foundation and enrichment curricula in the creation of products; 3.11s participate in electronic communities as a learner, initiator, and contributor; 3.12s complete tasks using technological collaboration such as sharing information through on-line communications; 3.13s use groupware, collaborative software, and productivity tools to create products; 3.14s use technology in self-directed activities to create products for and share products with defined audiences; 3.15s integrate acquired technology applications, skills, and strategies and use of the word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs into the foundation and enrichment curricula; 3.16s design and implement procedures to track trends, set time lines, and review/evaluate progress for continual improvement in process and product; and 3.17s resolve information conflicts and validate information through research and comparison of data from multiple sources.

SBEC Technology Applications Standards

Standard IV. **All teachers communicate information in different formats and for diverse audiences.**

Teacher Knowledge: What All Teachers Know

Teachers of Students in Grades EC-12

The beginning teacher knows and understands:

4.1k how to format digital information for appropriate and effectivecommunication;

4.2k how to deliver a product electronically in a variety of media; and

4.3k how to evaluate communication in terms of both process and product.

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12

The beginning teacher is able to:

4.1s use productivity tools, such as slide shows, posters, multimedia presentations, newsletters, brochures, or reports, to create effective document files for defined audiences;

4.2s demonstrate the use of a variety of layouts in a database, including horizontal and vertical layouts, to communicate information appropriately;

4.3s create a variety of spreadsheet layouts containing descriptive labels and page settings;

4.4s demonstrate appropriate use of fonts, styles, and sizes, as well as effective use of graphics and page design to communicate effectively;

4.5s match the chart style to the data when creating and labeling charts;

4.6s publish information in a variety of ways, including, but not limited to, printed copy, monitor displays, Internet documents, and video;

4.7s design and create interdisciplinary multimedia presentations that include audio, video, text, and graphics for defined audiences;

4.8s use telecommunication tools, such as Internet browsers, video conferencing, and distance learning, for publishing information;

4.9s design and implement procedures to track trends, set time lines, and review and evaluate products using technology tools such as database managers, daily/monthly planners, and project management tools;

4.10s determine and employ technology specifications to evaluate projects for design, content delivery, purpose, and audience and demonstrate that process and product can be evaluated using established criteria or rubrics;

SBEC Technology Applications Standards

Standard IV. **All teachers communicate information in different formats and for diverse audiences.**

	Application: What All Teachers Can Do
	Teachers of Students in Grades EC-12 (continued) 4.11s select representative products to be collected and stored in an electronic evaluation tool; and 4.12s evaluate products for relevance to the assignment or task.

SBEC Technology Applications Standards

Standard V. **All teachers know how to plan, organize, deliver, and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.**

Teacher Knowledge: What All Teachers Know

Teachers of Students in Grades EC-12

The beginning teacher knows and understands:

5.1k planning techniques to ensure that students have time to learn the Technology Applications TEKS in order to meet grade-level benchmark expectations;

5.2k where to find and how to utilize technological resources to implement the TEKS, to support instruction, to extend communication, to enhance classroom management, and to become more productive in daily tasks;

5.3k instructional strategies for teaching the Technology Applications TEKS and integrating them into the curriculum;

5.4k strategies that students with diverse strengths and needs can use to determine word meaning in content-related texts;

5.5k strategies that students with diverse strengths and needs can use to develop content-area vocabulary;

5.6k strategies that students with diverse strengths and needs can use to facilitate comprehension before, during, and after reading content-related texts;

5.7k how to evaluate the effectiveness of technology-based instruction; and

5.8k how to set goals for ongoing professional development in teaching the Technology Applications TEKS and integrating them into the curriculum.

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12

The beginning teacher is able to:

5.1s plan applications-based technology lessons using a range of instructional strategies for individuals and small/whole groups;

5.2s identify and address equity issues related to the use of technology, including, but not limited to, gender, ethnicity, language, disabilities, and student access to technology;

5.3s plan, select, and implement instruction that allows students to use technology applications in problem-solving and decision-making situations;

5.4s develop and implement, using technology applications, tasks that emphasize collaboration and teamwork among members of a structured group or project team;

5.5s provide adequate time for teaching the Technology Applications TEKS;

5.6s identify and use resources to keep current with technology education;

5.7s create project-based learning activities that integrate the Technology Applications TEKS into the curriculum and meet the Technology Applications TEKS benchmarks;

5.8s follow guidelines for the legal and ethical use of technology resources;

5.9s select and use developmentally appropriate instructional practices, activities, and materials to improve student learning of the Technology Applications TEKS;

5.10s use a variety of instructional strategies to ensure all students' reading comprehension of content-related texts, including helping students link the content of texts to their lives and connect related ideas across different texts;

Standard V. **All teachers know how to plan, organize, deliver, and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.**

Application: What All Teachers Can Do

Teachers of Students in Grades EC-12 (continued)

5.11s teach students how to locate, retrieve, and retain content-related information from a range of texts and technologies;

5.12s teach students how to locate the meanings and pronunciations of unfamiliar content-related words using appropriate sources, such as dictionaries, thesauruses, and glossaries;

5.13s use technology tools to perform administrative tasks such as taking attendance, maintaining grade books, and facilitating communication;

5.14s evaluate appropriately students' projects and portfolios using formal and informal assessment methods;

5.15s collect observable and measurable data to gauge student progress and adjust instruction in Technology Applications;

5.16s conduct an ongoing self-assessment of strengths and weaknesses in the knowledge and skills of Technology Applications;

5.17s develop and implement an individual plan for professional growth in the knowledge and skills of Technology Applications; and

5.18s incorporate new strategies to improve classroom instruction in Technology Applications.

SBEC Technology Applications Standards

***Standard VI.* The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Computer Science Know	Application: What Teachers of Computer Science Can Do
Teachers of Students in Grades 8-12	*Teachers of Students in Grades 8-12*
The beginning teacher of computer science knows and understands:	The beginning teacher of computer science is able to:
Foundations	**Foundations**
6.1k the appropriate use of hardware components, software programs, and their connections;	6.1s use necessary vocabulary related to computer science; 6.2s differentiate among properties of current programming languages, discuss the use of the languages in other fields of study, and demonstrate knowledge of specific programming terminology and concepts; 6.3s differentiate among the levels of programming languages, including machine, assembly, high-level compiled, and interpreted languages;
6.2k data input skills appropriate to a given task;	6.4s identify object-oriented data types and delineate the advantages/disadvantages of object data;
6.3k pertinent laws and issues regarding the use of technology in society;	6.5s demonstrate coding proficiency in contemporary programming languages, including an object-oriented language; 6.6s survey the issues accompanying the development of large software systems, such as design/implementation teams, software validation/testing, and risk assessment; 6.7s investigate measures, such as passwords and virus detection/prevention, to protect computer systems and databases from unauthorized use and tampering; 6.8s discuss the impact of computer programming on the World Wide Web (WWW) community; 6.9s code modules for the WWW community;

Standard VI. **The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Computer Science Know	Application: What Teachers of Computer Science Can Do
Information Acquisition	**Information Acquisition**
6.4k a variety of strategies for acquiring information from electronic resources;	6.10s design and document sequential search algorithms for digital information storage and retrieval; 6.11s construct searching algorithms, including linear and binary searches; 6.12s construct sorting algorithms, including quadratic algorithms such as selection, bubble and insertion, and more efficient algorithms such as merge, shell, and quick sorts; 6.13s compare and contrast searching and sorting algorithms for space and time requirements;
6.5k how to acquire electronic information in a variety of formats;	6.14s acquire information in and knowledge about a variety of electronic formats, including text, audio, video, and graphics; 6.15s use a variety of resources, including foundation and enrichment curricula, together with various productivity tools to gather authentic data as a basis for individual and group programming projects;
6.6k how to evaluate acquired electronic information;	6.16s determine and employ methods to evaluate the design and functionality of information acquisition processes and algorithms, using effective coding, design, and test data; 6.17s implement methods for the evaluation of acquired information using defined rubrics;

SBEC Technology Applications Standards

***Standard VI.* The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Computer Science Know	Application: What Teachers of Computer Science Can Do
Work in Solving Problems	**Work in Solving Problems**
6.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	6.18s apply problem-solving strategies such as design specifications, modular top-down design, step-wise refinement, and algorithm development;
	6.19s use visual organizers such as flowcharts and schematic drawings to design solutions to problems;
	6.20s develop sequential and iterative algorithms and code programs in prevailing computer languages to solve practical problems modeled from school and community;
	6.21s demonstrate effective use of predefined input and output procedures for lists of computer instructions, including procedures to protect from invalid input;
	6.22s develop coding with correct and efficient use of expressions and assignment statements, including the use of standard/user-defined functions, data structures, operators/proper operator precedence, and sequential/conditional/repetitive control structures;
	6.23s create and use libraries of generic modular code to be used for efficient programming;
	6.24s identify actual and formal parameters and use value and reference parameters;
	6.25s use control structures such as conditional statements and iterated, pretest, and post-test loops;
	6.26s use sequential, conditional, selection, and repetition execution control structures such as menu-driven programs that branch and allow user input;
	6.27s identify and use structured data types of one-dimensional arrays, records, and text files;

Standard VI. **The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Application: What Teachers of Computer Science Can Do

Work in Solving Problems (Continued)

6.28s use recursion appropriately and trace program design comparing invariant, iterative, and recursive algorithms;

6.29s manipulate data structures using string processing;

6.30s use notation for language definition, such as syntax diagrams and Backus-Naur forms;

6.31s identify, describe, and use sequential/nonsequential files and multidimensional arrays and arrays of records;

6.32s create robust programs with increased emphasis on design, style, clarity of expression, and documentation for ease of maintenance, program expansion, reliability, and validity;

6.33s apply methods for computing iterative approximations and statistical algorithms;

6.34s define and develop code using the concepts of abstract data types, including stacks, queues, linked lists, trees and graphs and incorporate the use of information hiding and encapsulation;

6.35s identify and describe the correctness and complexity of algorithms, such as divide and conquer, backtracking, and greedy algorithms;

6.36s develop software to solve a school or community problem such as customer relations, design, modular programming, documentation, validation, marketing, and support;

SBEC Technology Applications Standards

Standard VI. **The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Computer Science Know	Application: What Teachers of Computer Science Can Do
Work in Solving Problems (Continued)	Work in Solving Problems (Continued)
	6.37s research advanced computer science concepts such as applied artificial intelligence, expert systems, robotics, depth-first/breadth-first and heuristic search strategies, multitasking operating systems, and computer architecture, such as reduced instruction set computer (RISC) and complex instruction set computer (CISC);
6.8k how to use research skills and electronic communication to create new knowledge;	6.38s participate with electronic communities as a learner, initiator, contributor, and teacher/mentor to solve problems in computer science;
	6.39s extend the learning environment beyond the classroom with digital products created to increase teaching and learning in the foundation and enrichment curricula via electronic networks;
	6.40s participate in relevant, meaningful activities in the larger community and society to create electronic projects;
6.9k how to use technology applications to facilitate evaluation of work, including both process and product;	6.41s design and implement procedures to track trends, set time lines, and review/evaluate programming progress for continual improvement in process and product;
	6.42s use correct programming style, such as spacing, indentation, descriptive identifiers, formatting, comments, and documentation, to enhance the readability and functionality of code;
	6.43s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to computer programming;
	6.44s resolve information conflicts and validate information through accessing, researching, and comparing data;
	6.45s create technology specifications for tasks/evaluation rubrics and demonstrate that computer programming products/product quality can be evaluated against established criteria;

***Standard VI.* The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Application: What Teachers of Computer Science Can Do

Work in Solving Problems (Continued)

6.46s demonstrate the ability to read and modify large programs, including the design description and process development;

6.47s analyze algorithms using "big-O" notation and best, average, and worst-case space techniques;

6.48s compare and contrast design methodologies including top-down and bottom-up;

6.49s analyze models used in development of software, including software life cycle models, design objectives, documentation, and support;

SBEC Technology Applications Standards

Standard VI. **The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Computer Science Know

Communication

6.10k how to format digital information for appropriate and effective communication;

6.11k how to deliver a product electronically in a variety of media; and

6.12k how to evaluate communication in terms of both process and product.

Application: What Teachers of Computer Science Can Do

Communication

6.50s create interactive documents using modeling, simulation, and hypertext;

6.51s publish information in a variety of ways, including, but not limited to, software, Internet documents, and video;

6.52s write technology specifications for planning/evaluation rubrics documenting variables, prompts, and programming code internally and externally;

6.53s seek and respond to advice from colleagues and other professionals in evaluating a programming product; and

6.54s debug and solve problems using reference materials and effective strategies.

SBEC Technology Applications Standards

Standard VII. **The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	**Application: What Teachers of Desktop Publishing Can Do**
Teachers of Students in Grades 8-12	*Teachers of Students in Grades 8-12*
The beginning teacher of desktop publishing knows and understands:	The beginning teacher of desktop publishing is able to:
Foundations	**Foundations**
7.1k the appropriate use of hardware components, software programs, and their connections;	7.1s demonstrate knowledge of technology terminology and concepts and relate them to desktop publishing;
7.2k data input skills appropriate to a given task;	7.2s demonstrate proficiency in the use of a variety of input devices appropriate for producing desktop publishing products; 7.3s use digital keyboarding standards in word processing such as one space after punctuation, the use of em/en dashes, and smart quotation marks;
7.3k pertinent laws and issues regarding the use of technology in society;	7.4s model respect for intellectual property when manipulating, morphing, and editing graphics, and text; 7.5s analyze the impact of desktop publishing on society, including concepts related to persuasiveness, marketing, and point of view;

SBEC Technology Applications Standards

***Standard VII.* The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	Application: What Teachers of Desktop Publishing Can Do
Information Acquisition	**Information Acquisition**
7.4k a variety of strategies for acquiring information from electronic resources;	7.6s use strategies that conserve memory and retain image integrity when digitally capturing files;
	7.7s use strategies to obtain print and digital information from a variety of electronic resources including, but not limited to, reference software, databases, and libraries of images, citing the source;
	7.8s use strategies to navigate on and access information from local area networks (LANs), wide area networks (WANs), the Internet, and intranets;
7.5k how to acquire electronic information in a variety of formats;	7.9s acquire information in electronic formats including text, audio, video, and graphics, citing the source;
	7.10s demonstrate the ability to import and export elements from one program to another;
7.6k how to evaluate acquired electronic information;	7.11s identify and employ a method to evaluate acquired information;
	7.12s demonstrate skill in testing the accuracy and validity of acquired information;

SBEC Technology Applications Standards

Standard VII. **The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	**Application: What Teachers of Desktop Publishing Can Do**
Work in Solving Problems	**Work in Solving Problems**
7.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	7.13s use desktop publishing methods in foundation and enrichment curricula; 7.14s identify the tasks in a project and use tools, such as word processing, pagination, utility, indexing, graphics, and drawing programs, necessary to complete those tasks; 7.15s use electronic productivity tools, including move, copy, cut and paste, and spell check, to edit text; 7.16s select and use the categories of type, font, size, style, and alignment appropriate for the task; 7.17s apply the basic elements of page design, including text, graphics, headlines, and white space; 7.18s distinguish design requirements as they relate to purposes and audiences, including one-surface objects, multiple or bound pages, stationery, book jackets/magazine covers, pamphlets, magazines, brochures, and labels; 7.19s read and use technical documentation to solve problems in desktop publishing;
7.8k how to use research skills and electronic communication to create new knowledge;	7.20s develop technical documentation related to desktop publishing; 7.21s use technology to participate in self-directed and practical activities related to desktop publishing; 7.22s extend the learning environment beyond the classroom through the creation and sharing of electronically formatted and published documents via electronic networks;

***Standard VII.* The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	**Application: What Teachers of Desktop Publishing Can Do**
Work in Solving Problems (Continued)	**Work in Solving Problems (Continued)**
	7.23s synthesize new information from data gathered from interviews, print, and electronic resources;
	7.24s demonstrate that tasks can be accomplished through technological collaboration and participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;
7.9k how to use technology applications to facilitate evaluation of work, including both process and product;	7.25s create technology specifications for tasks and evaluation rubrics to evaluate process and product against established criteria;
	7.26s design and implement procedures to track trends, set time lines, and review/evaluate work progress for continual improvement in process and product;
	7.27s resolve information conflicts and validate information through accessing, researching, and comparing data;
	7.28s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to solving problems in desktop publishing;

SBEC Technology Applications Standards

Standard VII. **The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	**Application: What Teachers of Desktop Publishing Can Do**
Communication	**Communication**
7.10k how to format digital information for appropriate and effective communication;	7.29s define the purpose of a desktop publishing product and identify the specified audience; 7.30s use terms related to typography, including categories of type and type contrasts, appropriately; 7.31s use principles of page design, including, but not limited to, leading/kerning, automatic text flow into linked columns, widows/orphans, and text wrap, to create a product; 7.32s compare and contrast the rules of visual composition such as rule of thirds and the golden section/rectangle with respect to harmony and balance as well as discord and drama; 7.33s create a master template to include page specifications and other repetitive tasks; 7.34s apply the basics of type measurement for inches and picas; 7.35s use type techniques such as drop cap, decorative letters, and embedded-text frames as graphic elements; 7.36s apply color principles to communicate the mood of the product for a specific audience; 7.37s incorporate the principles of basic design, including, but not limited to, balance, contrast, dominant element, use of white space, consistency, repetition, alignment, and proximity; 7.38s identify pictorial qualities in a design such as shape and form, space and depth, and pattern and texture to create visual unity and desired effects in designs;

***Standard VII.* The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Desktop Publishing Know	**Application: What Teachers of Desktop Publishing Can Do**
Communication (Continued)	**Communication (Continued)**
	7.39s identify the parts and kinds of pages, including inside margin, outside margin, gutter, title, and inside pages;
	7.40s use a variety of strategies, such as varying line widths and patterns, and use manipulation tools to stretch, bend, screen, rotate, follow a path, and mirror type to create effective designs;
7.11k how to deliver a product electronically in a variety of media; and	7.41s use appropriate media for creating a knowledge base with a broad perspective and for communicating information and delivering a product to the worldwide community;
	7.42s use printing options such as tiling, color separations, collation, and previewing;
	7.43s distinguish design and printing requirements as they relate to purposes, audiences, and final output;
	7.44s use styles (style sheets), including a variety of type specifications such as typeface, style, size, alignment, indents, and tabs;
7.12k how to evaluate communication in terms of both process and product.	7.45s identify and employ a method to evaluate a desktop publishing project for design, content delivery, purpose, and audience;
	7.46s use electronic project management tools to set milestones for completing projects and reviewing work progress;
	7.47s seek and respond to advice from colleagues and other professionals in evaluating a desktop publishing product;
	7.48s create technology specifications for tasks and evaluation rubrics to evaluate the communication of a desktop publishing product; and
	7.49s demonstrate that desktop publishing products and product quality can be evaluated against established criteria.

SBEC Technology Applications Standards

Standard VIII. **The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Digital Graphics/Animation Know	**Application: What Teachers of Digital Graphics/ Animation Can Do**
Teachers of Students in Grades 8-12	*Teachers of Students in Grades 8-12*
The beginning teacher of digital graphics/animation knows and understands:	The beginning teacher of digital graphics/animation is able to:
Foundations	**Foundations**
8.1k the appropriate use of hardware components, software programs, and their connections;	8.1s make decisions regarding the selection, acquisition, and use of graphics and animation software, taking into consideration its quality, appropriateness, effectiveness, and efficiency;
	8.2s use the vocabulary related to digital graphics and animation software;
	8.3s distinguish among and correctly use process color (RGB and CYMK), spot color, and black/white;
	8.4s identify color mixing theories and apply these theories to create new colors in the digital format;
	8.5s compare, contrast, and integrate basic sound-editing principles, including the addition of effects and the manipulation of wave forms;
	8.6s distinguish among and use the components of animation software programs, including the animation control panel and cast, score, and stage;
	8.7s select and connect task-appropriate peripherals;
	8.8s distinguish between and use the animation techniques of path and cell animation;
8.2k data input skills appropriate to a given task;	8.9s demonstrate proficiency in the use and graphical integration of a variety of input devices;
	8.10s compare and contrast digital input devices;
8.3k pertinent laws and issues regarding the use of technology in society;	8.11s model respect for intellectual property when manipulating, morphing, and editing graphics, video, text, and sound;
	8.12s research digital graphics as an art form and the impact of digital graphics on society;

SBEC Technology Applications Standards

Standard VIII. **The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Digital Graphics/Animation Know	**Application: What Teachers of Digital Graphics/ Animation Can Do**
Information Acquisition	**Information Acquisition**
8.4k a variety of strategies for acquiring information from electronic resources;	8.13s obtain print and digital information from a variety of resources including, but not limited to, encyclopedias, databases, and libraries of images;
8.5k how to acquire electronic information in a variety of formats;	8.14s use the Internet to retrieve information in electronic formats including text, audio, video, and graphics, citing the source;
	8.15s demonstrate the appropriate use of digital imaging, video integration, and sound in documents;
	8.16s import sounds from a variety of sources;
8.6k how to evaluate acquired electronic information;	8.17s compare and contrast the rules of visual composition, such as rule of thirds and the golden section/rectangle, with respect to harmony and balance as well as discord and drama;
	8.18s evaluate the fundamental concepts of a graphic design, including composition and lighting;
	8.19s analyze graphic designs to decide the point of interest and the attributes that determine prominence and support of the subject;
	8.20s distinguish among the categories of typefaces while recognizing and resolving conflicts that occur through combined usage;

SBEC Technology Applications Standards

Standard VIII. **The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Digital Graphics/Animation Know	Application: What Teachers of Digital Graphics/ Animation Can Do
Work in Solving Problems	**Work in Solving Problems**
8.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	8.21s combine graphics, images, and sound for foundation and enrichment curricular projects;
	8.22s integrate productivity tools, including, but not limited to, word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs, into digital graphics;
	8.23s use perspective, including backgrounds, light, shades/shadows, and scale to capture a focal point and create depth;
	8.24s use the basic principles of proportion, balance, variety, emphasis, harmony, symmetry, and unity in type, color, size, line thickness, shape, and space;
	8.25s use repetition of color, shape, texture, spatial relationships, line thickness, and size to develop organization and strengthen the unity of a product;
	8.26s create three-dimensional effects using foreground, middle distance, and background images;
	8.27s apply a variety of color schemes to digital designs, including monochromatic, analogous, complementary, primary/secondary triads, cool/warm colors, and split complements;
	8.28s use the basic concepts of color and design theory to work in a bitmapped mode, creating backgrounds, characters, and other case members as needed for an animation;
	8.29s use appropriate scripting languages to create an animation or movie;
	8.30s read, use, and develop technical documentation related to digital graphs/animation;

SBEC Technology Applications Standards

Standard VIII. **The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Digital Graphics/Animation Know	Application: What Teachers of Digital Graphics/Animation Can Do
Work in Solving Problems (Continued)	Work in Solving Problems (Continued)
	8.31s edit files using appropriate digital editing tools and established design principles including consistency, repetition, alignment, proximity, ratio of text to white space, image file size, color use, font size, type, and style;
	8.32s use a variety of techniques to edit, manipulate, and change sounds;
8.8k how to use research skills and electronic communication to create new knowledge;	8.33s use technology to participate in self-directed, meaningful activities in the larger community and society;
	8.34s demonstrate proficiency in, appropriate use of, and navigation of local area networks (LANs), wide area networks (WANs), the Internet, and intranet for research and for sharing resources;
	8.35s participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;
8.9k how to use technology applications to facilitate evaluation of work, including both process and product;	8.36s create technology specifications for problem-solving tasks and rubrics to evaluate digital graphics/animation products and product quality against established criteria;
	8.37s design and implement procedures to track trends, set time lines, and review/evaluate problem-solving progress;
	8.38s evaluate data using criteria appropriate for the purpose;
	8.39s resolve information conflicts and validate information through accessing, researching, and comparing data;
	8.40s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to solving problems in digital graphics/animation;

SBEC Technology Applications Standards

***Standard VIII.* The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Digital Graphics/Animation Know	**Application: What Teachers of Digital Graphics/ Animation Can Do**
Communication	**Communication**
8.10k how to format digital information for appropriate and effective communication;	8.41s identify pictorial qualities in a design, such as shape and form, space and depth, and pattern and texture, to create visual unity and desired effects in designs;
	8.42s use a variety of lighting techniques, including shadows and shading to create an effect;
	8.43s define the design attributes and requirements of products created for a variety of purposes, including posters, billboards, business cards, stationery, book jackets, folders, booklets, pamphlets, brochures, and magazines;
	8.44s use proximity and alignment to create a visual connection with other elements;
8.11k how to deliver a product electronically in a variety of media; and	8.45s publish information in a variety of formats;
8.12k how to evaluate communication in terms of both process and product.	8.46s determine and employ technology specifications to evaluate digital graphics/animation projects for design, content delivery, purpose, and audience; and
	8.47s seek and respond to advice from colleagues and other professionals in evaluating a digital graphics/ animation product.

SBEC Technology Applications Standards

***Standard IX.* The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Multimedia Know

Teachers of Students in Grades 8-12

The beginning teacher of multimedia knows and understands:

Foundations

9.1k the appropriate use of hardware components, software programs, and their connections;

Application: What Teachers of Multimedia Can Do

Teachers of Students in Grades 8-12

The beginning teacher of multimedia is able to:

Foundations

9.1s analyze demands for accomplishing multimedia tasks to use input, processing, output and primary/secondary storage devices appropriately;

9.2s make decisions regarding the selection, acquisition, and use of software in a multimedia classroom/lab, taking under consideration its quality, appropriateness, effectiveness, and efficiency;

9.3s delineate and make necessary adjustments regarding compatibility issues, including, but not limited to, digital file formats and cross-platform connectivity;

9.4s use necessary vocabulary related to multimedia;

9.5s distinguish among and correctly use process color (e.g., RGB and CYMK), spot color, and black/white;

9.6s identify color mixing theories and apply these theories to create new colors in the digital format;

9.7s identify and distinguish among basic sound-editing principles, including the addition of effects and the manipulation of wave forms;

9.8s identify and use compression schemes for photo, animation, audio, video, and graphics;

9.9s distinguish between and determine the appropriate application of bitmapped and vector graphics for a multimedia project;

SBEC Technology Applications Standards

***Standard IX.* The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Multimedia Know	**Application: What Teachers of Multimedia Can Do**
Foundations (Continued)	**Foundations (Continued)**
9.2k data input skills appropriate to a given task;	9.10s demonstrate proficiency in the use of a variety of electronic input devices by creating files for multimedia products;
	9.11s use strategies that conserve memory and retain image integrity when digitally capturing files;
	9.12s differentiate among types of audio input;
9.3k pertinent laws and issues regarding the use of technology in society;	9.13s model respect for intellectual property when manipulating, morphing, and editing graphics, video, text, and sound;
	9.14s provide examples of the role of multimedia in society;
9.4k a variety of strategies for acquiring information from electronic resources;	
9.5k how to acquire electronic information in a variety of formats;	9.15s acquire information in electronic formats, including text, audio, video, and graphics, citing the source;
	9.16s identify, create, and use available file formats, including text, image, video, and audio files;
9.6k how to evaluate acquired electronic information;	9.17s identify and employ a method to evaluate the design, functionality, and accuracy of acquired information;
	9.18s use fundamental concepts of graphic design, including visual composition and lighting when analyzing multimedia;

SBEC Technology Applications Standards

Standard IX. **The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Multimedia Know	Application: What Teachers of Multimedia Can Do
Work in Solving Problems	**Work in Solving Problems**
9.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	9.19s use foundation and enrichment curricula in the creation of multimedia products; 9.20s select and integrate computer-based productivity tools, including, but not limited to, word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs, to develop and modify solutions to problems and to create new knowledge for multimedia products; 9.21s apply color principles to communicate the mood of a product for a specific audience; 9.22s integrate path and cell animation modules appropriately into multimedia products; 9.23s use appropriate scripting language to create a multimedia sequence; 9.24s edit files using established design principles, including consistency, repetition, alignment, proximity, ratio of text to white space, image file size, color use, font size, type, and style; 9.25s read and use technical documentation to solve problems in multimedia;
9.8k how to use research skills and electronic communication to create new knowledge;	9.26s participate with electronic communities as a learner, initiator, contributor, and teacher/mentor and use multimedia technology to participate in self-directed and practical activities in the larger community and society; 9.27s demonstrate proficiency in, appropriate use of, and navigation of local area networks (LANs), wide area networks (WANs), the Internet, and intranets for research and for sharing of resources; 9.28s integrate and use efficiently and effectively a variety of multimedia programs and tools including linear/nonlinear authoring tools, image/video editing tools, compression programs, and draw/paint/text creation tools;

SBEC Technology Applications Standards

***Standard IX.* The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Multimedia Know	**Application: What Teachers of Multimedia Can Do**
Work in Solving Problems (Continued)	**Work in Solving Problems (Continued)**
	9.29s extend the learning environment beyond the classroom through the creation and linking of multimedia products via electronic networks;
	9.30s develop technical documentation related to multimedia;
	9.31s participate in different roles and jobs of a multimedia production crew, including project manager, lead programmer, writer, art director, sound engineer, researcher, animator, and presenter;
	9.32s distinguish among and appropriately integrate 3-D modeling, animation, and rendering software into multimedia products;
	9.33s import video into the digital format for integration into multimedia products;
	9.34s capture, record, and integrate sampled and Musical Instrument Digital Interface (MIDI) sound in different sound rates, resolutions, and channels;
9.9k how to use technology applications to facilitate evaluation of work, including both process and product;	9.35s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to solving problems in multimedia;
	9.36s create technology specifications for tasks and rubrics to evaluate multimedia products and product quality against established criteria;
	9.37s resolve information conflicts and validate information by accessing, researching, and comparing data and demonstrate that multimedia products and product quality can be evaluated against established criteria;

SBEC Technology Applications Standards

Standard IX. **The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Multimedia Know	**Application: What Teachers of Multimedia Can Do**
Communication	**Communication**
9.10k how to format digital information for appropriate and effective communication;	9.38s identify quality in multimedia design, such as consistency, alignment, repetition, and proximity;
	9.39s use content selection and presentation for the defined audience and communication purpose;
	9.40s format multimedia projects according to defined output specifications, including target audience and viewing environment;
9.11k how to deliver a product electronically in a variety of media; and	9.41s publish information in a variety of ways;
9.12k how to evaluate communication in terms of both process and product.	9.42s determine and employ technology specifications to evaluate projects for design, content delivery, purpose, and audience; and
	9.43s seek and respond to input from colleagues and other professionals in evaluating a multimedia product.

SBEC Technology Applications Standards

Standard X. **The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Video Technology Know	**Application: What Teachers of Video Technology Can Do**
Teachers of Students in Grades 8-12	*Teachers of Students in Grades 8-12*
The beginning teacher of video technology knows and understands:	The beginning teacher of video technology is able to:
Foundations	**Foundations**
10.1k the appropriate use of hardware components, software programs, and their connections;	10.1s demonstrate knowledge and appropriate use of digital and analog video systems, software applications, and communication and networking components; 10.2s compare, contrast, and appropriately use the various input, processing, output, and primary/secondary storage devices; 10.3s make decisions regarding the selection, acquisition, and use of video technology software, taking into consideration its quality, appropriateness, effectiveness, and efficiency; 10.4s use vocabulary related to video technology; 10.5s compare and contrast linear and nonlinear editing;
10.2k data input skills appropriate to a given task;	10.6s outline differences among electronic input devices as related to video technology; 10.7s demonstrate proficiency in the use of a variety of electronic input devices by incorporating such components into video-related products;
10.3k pertinent laws and issues regarding the use of technology in society;	10.8s analyze the impact of video technology on society;
10.4k a variety of strategies for acquiring information from electronic resources;	
10.5k how to acquire electronic information in a variety of formats;	10.9s acquire information in electronic formats, including text, audio, video, and graphics, citing the source; 10.10s engage in preproduction planning by surveying sites and obtaining necessary permits and release forms;
10.6k how to evaluate acquired electronic information;	10.11s demonstrate skill in testing the accuracy and validity of acquired information;

SBEC Technology Applications Standards

Standard X. **The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Video Technology Know	**Application: What Teachers of Video Technology Can Do**
Work in Solving Problems	**Work in Solving Problems**
10.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	10.12s use foundation and enrichment curricula in the development of video and digital products;
	10.13s integrate productivity tools to develop and modify solutions to problems for video productions;
	10.14s create video products for a variety of purposes and audiences;
	10.15s develop technical documentation related to video technology;
10.8k how to use research skills and electronic communication to create new knowledge;	10.16s demonstrate proficiency in, appropriate use of, and navigation of local area networks (LANs), wide area networks (WANs), the Internet, and intranets for research and for sharing of resources;
	10.17s participate in relevant activities in the larger community and society to create video projects;
	10.18s extend the learning environment beyond the classroom through the creation and sharing of video products via electronic networks;
	10.19s demonstrate knowledge in composition, including ratio of image to frame, position in frame, line of gaze, pan/tilts, movement, and perspective;
	10.20s demonstrate proficiency in basic camera techniques, including zoom, focus, iris control, white balance, and filters;
	10.21s create visual communication by applying the strategies of script writing;
	10.22s engage in preproduction activities, including storyboarding, script writing, production, contracting, and scheduling;
	10.23s utilize lighting techniques, including key, fill, and backlight, and using incident/reflected light, color temperatures, and filters;

SBEC Technology Applications Standards

***Standard X.* The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Video Technology Know	**Application: What Teachers of Video Technology Can Do**
Work in Solving Problems (Continued)	**Work in Solving Problems (Continued)**
	10.24s use audio techniques to create, edit and integrate digital sounds;
	10.25s participate in different roles and jobs of a production crew, including executive producer, producer, director, engineer, script writer, editor, camera person, presenter, and audio technician;
	10.26s apply appropriate postproduction techniques, including editing and creating control and/or time coded tracks, transitions, audio levels, background music, and special sound effects;
	10.27s apply 2-D, 3-D, and multidimensional animation effects to video;
	10.28s use character generators, fonts, colors, and principles of compositions to create graphic images;
	10.29s create captions and titles for video and graphics;
	10.30s use different compression techniques and programs;
	10.31s demonstrate knowledge in outputting digital video to analog and analog video to digital;
10.9k how to use technology applications to facilitate evaluation of work, including both process and product;	10.32s design and implement procedures to track trends, set time lines, and review/evaluate progress for continual improvement in work process and product;
	10.33s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to video technology;
	10.34s create technology specifications for problem-solving tasks and evaluation rubrics;
	10.35s resolve information conflicts and validate information by accessing, researching, and comparing data related to video technology;
	10.36s monitor work process and product quality using established criteria;

SBEC Technology Applications Standards

Standard X. **The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Video Technology Know	**Application: What Teachers of Video Technology Can Do**
Communication	**Communication**
10.10k how to format digital information for appropriate and effective communication;	10.37s use font attributes and color to ensure that products are appropriate for the defined audience and communication purpose;
	10.38s use white space and graphics to ensure that products are appropriate for the defined audience and communication purpose;
	10.39s use camera perspective to ensure that products are appropriate for the defined audience and communication purpose;
	10.40s use content selection and presentation to ensure that products are appropriate for the defined audience and communication purpose;
10.11k how to deliver a product electronically in a variety of media; and	10.41s publish information in a variety of ways;
10.12k how to evaluate communication in terms of both process and product.	10.42s evaluate video technology projects for design, content delivery, purpose, and audience using established criteria;
	10.43s seek and respond to advice from colleagues and other professionals in evaluating video technology products; and
	10.44s perform research to determine the best method of distribution, the number of copies of the finished product needed, and the most appropriate method for promoting a video technology product.

SBEC Technology Applications Standards

Standard XI. **The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Web Mastering Know	Application: What Teachers of Web Mastering Can Do
Teachers of Students in Grades 8-12	*Teachers of Students in Grades 8-12*
The beginning teacher of Web mastering knows and understands:	The beginning teacher of Web mastering is able to:
Foundations	**Foundations**
11.1k the appropriate use of hardware components, software programs, and their connections;	11.1s make decisions regarding the selection, acquisition, and use of software related to Web mastering, taking into consideration its quality, appropriateness, effectiveness, and efficiency;
	11.2s delineate and make necessary adjustments regarding compatibility issues, including, but not limited to, digital file formats and cross-platform connectivity;
	11.3s use vocabulary related to Web mastering and differentiate between characteristics of the Internet and an intranet;
	11.4s plan and design Web pages that are accessible to diverse audiences (e.g., visually impaired, deaf and hearing impaired, learning disabled);
	11.5s summarize the technical needs for a World Wide Web (WWW) server;
	11.6s summarize the development of Internet protocols, including, but not limited to, Hypertext Transfer Protocol (HTTP), Gopher, File Transfer Protocol (FTP), telnet, and Wide Area Information System (WAIS);
11.2k data input skills appropriate to a given task;	11.7s demonstrate proficiency in the use of a variety of electronic input devices such as keyboard, scanner, voice/sound recorders, mouse, touch screen, and digital video by incorporating such components while publishing WWW pages;
11.3k pertinent laws and issues regarding the use of technology in society;	11.8s analyze the impact of the WWW on society through research, interviews, and personal observation;

SBEC Technology Applications Standards

Standard XI. **The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Web Mastering Know	Application: What Teachers of Web Mastering Can Do
Information Acquisition	**Information Acquisition**
11.4k a variety of strategies for acquiring information from electronic resources;	11.9s obtain uniform resource locators (URLs) and distinguish among the protocols, including Hypertext Transfer Protocol (HTTP), Gopher, File Transfer Protocol (FTP), telnet, and Wide Area Information System (WAIS);
11.5k how to acquire electronic information in a variety of formats;	11.10s acquire information in electronic formats, including text, audio, video, and graphics;
	11.11s model respect for intellectual properties when acquiring information in electronic formats;
	11.12s identify, create, and use available file formats including text, image, video (analog and digital), and audio files;
11.6k how to evaluate acquired electronic information;	11.13s determine and employ methods to evaluate the design (for content delivery) and functionality (for navigation and interaction) of WWW pages and to compare the method employed with other established evaluation methods;
	11.14s demonstrate skill in testing the accuracy of acquired information;
	11.15s investigate electronic security methods and choose a method to protect a Web server from unauthorized access and negative intentions;

SBEC Technology Applications Standards

***Standard XI.* The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Web Mastering Know	**Application: What Teachers of Web Mastering Can Do**
Work in Solving Problems	**Work in Solving Problems**
11.7k how to use appropriate computer-based productivity tools to create and modify solutions to problems;	11.16s use technology tools to create a knowledge base with a broad perspective for creating and modifying solutions to WWW mastering problems;
	11.17s select appropriate productivity tools and integrate them into WWW documents;
	11.18s use foundation and enrichment curricular content in the creation of WWW pages;
	11.19s create WWW pages using specific authoring tools such as text-based editing programs and graphical-based editing programs;
	11.20s read, use, and develop technical documentation related to Web mastering;
	11.21s create and edit WWW documents using established design principles, including consistency, repetition, alignment, proximity, ratio of text to white space, image file size, color use, font size, type, and style;
	11.22s demonstrate the ability to control access to a WWW site via password controls and global access/deny controls;
	11.23s establish a folder/directory hierarchy for storage of a Web page and its related and linked files;
11.8k how to use research skills and electronic communication to create new knowledge;	11.24s demonstrate proficiency in, appropriate use of, and navigation of local area networks (LANs), wide area networks (WANs), the Internet, and intranets for research and for sharing resources;
	11.25s extend teaching and learning in the local environment to the worldwide community through the creation and sharing of WWW documents;
	11.26s synthesize and generate new information from data gathered from electronic and telecommunications resources;

SBEC Technology Applications Standards

Standard XI. **The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Web Mastering Know	Application: What Teachers of Web Mastering Can Do
Work in Solving Problems (Continued)	Work in Solving Problems (Continued)
	11.27s create and format WWW documents containing bookmarks of on-line resources and share them electronically;
	11.28s demonstrate the use of WWW pages, collaborative software, and productivity tools to create products;
	11.29s participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;
	11.30s participate in relevant, meaningful activities in the larger community and society to create electronic WWW projects;
11.9k how to use technology applications to facilitate evaluation of work, including both process and product;	11.31s design and implement procedures to track trends, set time lines, and review/evaluate work progress for continual improvement in process and product;
	11.32s seek and respond to advice from colleagues and other professionals in delineating technological tasks related to Web mastering;
	11.33s create technology specifications for tasks and evaluation rubrics to evaluate problem-solving processes;
	11.34s resolve information conflicts and validate information through accessing, researching, and comparing data;

SBEC Technology Applications Standards

***Standard XI.* The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.**

Teacher Knowledge: What Teachers of Web Mastering Know	**Application: What Teachers of Web Mastering Can Do**
Communication	**Communication**
11.10k how to format digital information for appropriate and effective communication;	11.35s use hypertext linking appropriately when creating WWW pages; 11.36s develop interactivity for a Web server via scripting; 11.37s demonstrate the ability to conduct secure transactions from a Web server to a client;
11.11k how to deliver a product electronically in a variety of media; and 11.12k how to evaluate communication in terms of both process and product.	11.38s create technology specifications for tasks and evaluation rubrics to evaluate a WWW communication product; and 11.39s seek and respond to input from colleagues and other professionals in evaluating a WWW communication product.

TECHNOLOGY APPLICATIONS STANDARDS

Standard I. All teachers use technology-related terms, concepts, data input strategies, and ethical practices to make informed decisions about current technologies and their applications.

Standard II. All teachers identify task requirements, apply search strategies, and use current technology to efficiently acquire, analyze, and evaluate a variety of electronic information.

Standard III. All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions, and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.

Standard IV. All teachers communicate information in different formats and for diverse audiences.

Standard V. All teachers know how to plan, organize, deliver, and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.

Standard VI. The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I-V.

Standard VII. The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I-V.

Standard VIII. The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I-V.

Standard IX. The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I-V.

Standard X. The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I-V.

Standard XI. The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I-V.

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